A Comparative Study of the Sources of Competitive Advantage in the New Zealand and Uruguayan Beef Industries

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A thesis
submitted in partial fulfilment
of the requirements for the Degree of
Master in Applied Science

at

Lincoln University

by

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Lincoln University
2003

Abstract of a Thesis Submitted in Partial Fulfilment of the
Requirements for the Degree of M.Appl.Sc.

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According to Porter (1990), there are certain characteristics of a country that allow its industries to create and sustain competitive advantage, or prevent them from doing so. The objective of this study was to identify and compare the sources of competitive advantage or disadvantage for the Uruguayan and New Zealand beef industries. To accomplish these objectives, Porter's Diamond Framework was selected as the theoretical framework to assess the competitive advantage of nations. Two case studies "*the Beef Industry in Uruguay"* and "*the Beef Industry in New Zealand"* were carried out. The information was obtained from secondary sources and open-ended interviews to key informants in both countries.

Uruguay and New Zealand possess observable similarities, such as size, population, similar farmland area, and an economy based on agriculture with low levels of subsidies and trade regulations. In addition, the industries in both countries target the international market. Considering beef production, these countries produce beef based on pastures; hence, they have similar seasonal fluctuations in slaughter and in the product offered into the market. These similarities make these countries interesting to compare.

On the other hand, Uruguay and New Zealand have differences. They are in different stages of economic development, and have cultural, sociological and educational differences. The beef industry is the most important economic activity in Uruguay, as can be illustrated by the resources allocated in this sector and in the volume and value of exported beef. In New Zealand, the beef industry is less important; however, it constitutes an excellent complementary activity for sheep and dairy productions. Both beef industries

also have differences in their levels of productivity, stock compositions, stock categories, age of slaughtered animals, sanitary status, and locations in relation to markets. This suggests different sources of competitive advantage.

The results show that the Uruguayan beef industry has a weaker diamond than its New Zealand counterpart does. However, the industry in Uruguay has been increasing the use of resources in comparison to other pastoral activities such as dairy and sheep. In contrast, the New Zealand beef industry, despite having a stronger diamond than the Uruguayan beef industry, has a secondary role behind the sheep and dairy industry. There are two clear limitations for the Uruguayan beef industry. First, the performance of the primary sector is poor. Second, the Uruguayan exported beef receives a lower price than the New Zealand product, and has difficulties for gaining access to certain markets. These two characteristics were identified as the most dissimilar for both industries.

The selected research design and theoretical framework were adequate to accomplish the objectives. Although most of Porter's findings were not supported in this study, using the framework allowed the development of an exhaustive analysis of the possible factors affecting the sources of competitive advantage in both industries. Comparing diamonds in different countries has not been done before; therefore, this research provides empirical evidence of the advantages and disadvantages of using this framework for international comparisons. Finally, the information presented in this research did not intend to suggest possible strategies or policies to increase the competitiveness of both industries. However, the results are likely to provide useful information for further studies in these industries.

Key Words: Competitive advantage, Porter's Diamond Framework, beef industry, Uruguay, New Zealand

Acknowledgements

This thesis is the result of the contributions of the Ministry of Foreign Affairs and Trade of New Zealand, who granted me a NZAID Award, and many other people. Firstly, I would like to recognise the contributions of Dr Keith Woodford and Dr Sandra Martin, my supervisors, who helped me narrow down the topic of this thesis, and read and corrected this work. I need to thank as well the assistance of several staff members at the AMAC Division who helped me during my studies at Lincoln University, especially to Pat Quarles and Wendy Brook. I also would like to thank the Faculty of Agronomy for supporting my study in New Zealand. I would like to specially thank Pedro Arbeletche and Gonzalo Gutierrez for helping me while I was applying to come to New Zealand.

I am greatly indebted to the members of the beef industries in New Zealand and in Uruguay, who kindly agreed to be interviewed and provided the critical information that was the basis of this research; without them this work would not have been possible. Special thanks to the assistance of Vicente Plata; Carlos Correa, Carlos Maria Uriarte, Maria del Carmen Vilanova, and Neil Gow who provided me with useful information and assisted me with the organisation of few interviews.

I would also like to thank all of my friends whom I met while in New Zealand, whose support and friendship made my life in this country happier, specially to Bernice, the Uruguayan group: the Alvarez family, Virginia, Gustavo and Olga, Susan, Sarah, Maggy, Jorge, Mika, Mami, Altair, Marcelo, Marco, Ricardo, and to all my friends from “Asi es Latinoamerica”.

I am indebted to the assistance and advice of Juan, who during this Master, helped me in several instances and was my support to achieve this goal. Si hoy pude alcanzar este objetivo es porque siempre estuvo a mi lado, y con su paciencia y comprensión me ayudo a superar los momentos difíciles que enfrenté durante el desarrollo de este trabajo.

Finalmente mi más profunda gratitud a mis padres Orfilia y Tito, sin su cariño, apoyo y consejo yo no hubiera estado aquí. También deseo agradecer a Rosana, mi hermana por estar siempre apoyándome, y a toda mi gran familia y amigos que desde Uruguay me

apoyaron y me aconsejaron durante todo este tiempo en Nueva Zelanda, y especialmente a mi amigo Gabriel, sin ellos todo hubiese sido más difícil.

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Abbreviations

BSE	Bovine Spongiform Encephalopathy
CL	Chemical Lean
EEC	European Economic Community
EU	European Union
FMD	Foot and Mouth Disease
FOB	Free on Board
GDP	Gross Domestic Products
MERCOSUR	Common Market of the Southern Cone
NAFTA	North American Free Trade Agreement
NZ$	New Zealand Dollar
OIE	Office International Epizooties
$	Uruguayan Currency (Peso Uruguayo)
TB	Tuberculosis
Tonne	Kilo Tonne
UK	United Kingdom
US	United States of America
USDA	United State Department of Agriculture
US$	American Dollar
WTO	World Trade Organisation

CHAPTER 1

Purpose of this Research

1.1 - Introduction

Industries from small countries, such as the beef industry in Uruguay and in New Zealand, with small domestic markets and a steady level of consumption, need to focus on the international markets for further development of their industries. In this situation the competitiveness of the industry in the international arena is very important in defining the performance that the firms participating in the industry may obtain.

The liberalisation and globalisation of markets occurred in recent decades have increased the international competition for agriculture. There is an increasing number of competitors from different countries and the barriers to enter new markets are slowly becoming lower (Boehlje & Sonka, 1998). In this highly competitive environment, the low cost of production, based on natural comparative advantages is, by itself, insufficient as a source of sustainable competitive advantage. For the Uruguayan and New Zealand beef industries, the low cost of animal production based on their pastoral production systems has always been their main source of competitiveness (Alonso, *et al*., 1983; Vega, 2001; Crocombe, *et.al*., 1991). Therefore, Uruguay as well as New Zealand, also need to be highly efficient in the other stages of the chain, such as in the beef processing, in the allocation of the product (domestically and internationally) and in the relationships among the different stages of the supply chain (Vega, 2001; COMISEC, 1995; MAF, 2002).

Generally beef has been considered a commodity product. Low cost of production has been the main strategy for beef producers; hence, there has been little emphasis on strategies for product differentiation. However, in recent times, the general situation for food products has changed and new opportunities have appeared. Consumers (mainly from developed countries) are demanding and are willing to pay for high and consistent quality, additional information from the producers, high sanitary standards, convenience in preparation, food safety and nutritional value (Boehlje,1998; O'Keefe, 1997; Barry,

1995). Therefore, there are new alternatives to obtain competitive advantage in food products; for example, differentiating the product with brands, superior quality, certification of origin, ready to cook products, cooked meals, organic or natural certified products, and additional information available for the consumer. There are also other alternatives such as developing advanced and efficient marketing channels, or focussing on special segments of the market, satisfying the end consumer with the product they want (Boehlje, 1998).

This research focuses on analysing the Uruguayan and New Zealand's beef industries in this new environment. The following sections present the reasons for doing a comparative study between Uruguay and New Zealand.

1.2 - Uruguay & New Zealand

Although, Uruguay and New Zealand have some differences, since they are in different economic development stages, and have cultural, sociological and educational differences, both countries have several similarities. These similarities have been used on several occasions as a reason for comparing them. Uruguay and New Zealand have relatively similar sizes and population, similar farmland area, an economy based on agriculture (mainly pastoral agriculture) with low levels of subsidies or trade regulations, and a focus on the international market for most industries.

There are also other interesting associations between Uruguay and New Zealand. New Zealand has been a benchmark for Uruguayan agriculture. Since the early 1960s farming technologies (e.g. seeds, grazing management techniques, pasture improvement technology, fertiliser management, fencing techniques) have been introduced into Uruguay from New Zealand[1], by a programme developed by the "*Instituto Plan Agropecuario"* (IPA) to increase the performance of sheep and beef production in Uruguay (Alonso, *et al*., 1983). This relationship has also included the training of professionals in the agricultural field. This situation has continued until now, with professionals coming to New Zealand to do postgraduate studies and with tours of

[1] However, several failures in the application of the technology in commercial farms prevented the technology from being adopted by sheep and beef farmers. Dairy farmers adopted these technologies instead, and dairy production has expanded since the 1970s.

farmers around New Zealand (FUCREA, 2001). In the meat processing sector, New Zealand (like Australia) has also been a benchmark for the Uruguayan industry, with specialists from New Zealand participating in the installation of processing plants and cooling stores in Uruguay, and plant managers visiting New Zealand and Australian plants (INAC, 2002).

1.3 - The Uruguayan and New Zealand Beef Industries

In regard to beef production, there are both similarities and differences. Both countries produce mainly grass-fed beef; therefore, they compete with a similar product in similar markets (INAC, 2002; Meat NZ, 2002). They are competing with each other for market share in some countries such as the US, Japan and Canada. Currently, they allocate most of their products to undifferentiated markets. In addition, because of their similar production systems, both countries have similar seasonal fluctuations in slaughtering and of the product offered into the market.

Because of the small domestic markets of Uruguay and New Zealand, both countries allocate most of their product to the international market. In the case of Uruguay, beef delivered to the domestic market has been decreasing in relation to the total amount of beef produced, but still accounts for 40% of the beef produced. However, Uruguayan consumption is not expected to increase, so any increment in beef production needs to be sold in the international market (INAC, 2002). New Zealand has a clear export focus, with around 80% of its beef production marketed internationally (Meat NZ, 2002). Therefore, in New Zealand, most of the increase in beef production needs to be allocated in the international market as well.

In the world scene both countries are small producers compared to the US and Brazil, which contribute 21.5% and 11% of the world beef production, respectively. Uruguay and New Zealand contribute less than 1% of the total world beef production. Considering the world beef trade, Uruguay participates with 4.42% and New Zealand with 7.45% of the marketed beef. The main participants in the beef world trade are the US, (19.4%), Australia (22.7%) and Brazil (10%). Since beef produced by Uruguay and New Zealand is only a small proportion of the total beef traded internationally, it does not have major influence on the international beef price (INAC, 2002, MAF, 2002).

Both countries also have observable differences, such as different climatic conditions (temperature and rainfall) and different variability along the country, different categories, ages and weight of animals for slaughtering. In addition, they have a different location in relation to markets, sanitary status in relation to FMD (Foot and Mouth Disease) and different conditions to prevent the entrance of any disease (INAC, 2002; MAF,2001).

The size of the industry in the international market is also different. Considering meat and beef exported in both countries the following can be appreciated. In Uruguay, in 2002, meat and meat products[2] exported represented 335 million US$ (FOB). Beef was the main product exported, representing 80% of this value with 269 million US$ (FOB) (INAC, 2002). In 2002 in New Zealand, meat products[3] exported represented 2,257 million US$ (FOB). Beef exported was 910 million US$ (FOB). In 2002, New Zealand exported 473,000 tonnes carcass weight and Uruguay exported 258, 000 tonnes carcass weight. The average prices received for New Zealand beef was 1,923 US$/tonne carcass weight and Uruguayan beef received 1,042 US$/tonne carcass weight (MAF, 2002; INAC, 2002).

The similarities and differences of the beef industry in the two countries make the two situations interesting to compare. By comparing these two industries, it is possible to obtain some insights into how competitive advantage is created and how the two industries could be improved It will provide evidence about how these differences affect the competitiveness in the two industries.

1.4 - The Research Problem and Rationale

The beef industry is the most important economic activity in Uruguay in relation to export value, the number of people employed, and the resources allocated, and hence its performance has an important effect in the Uruguayan economy (Chiara, 2002). Several studies have been developed, aiming to find the means to increase its performance and to identify the main constrains for industry development (Arroyo, 2001). Before the 1980s the studies were mainly focussed on the farming phase and on the effect of governmental

[2] Includes beef, sheepmeat, offals, by-products and other products
[3] Includes beef and veal, lamb, mutton and hogget, venison and other meats

policies on the industry. There were few studies about the processing industry and even fewer about the markets. Alonso, *et al.,* in 1983, authorised one of the first studies focussing on an integrated analysis of the industry, including the farming sector, the processing industry and the markets. This study also included an analysis of the effect on the industry of the liberalisation policy that occurred in Uruguay in the late 1970s. More recently, there have also been other studies with a chain focus (Vazquez Platero & Picerno, 1994; COMISEC, 1995, Vega, 2001, Ordeix, 2001). These studies identified several limitations, such as the low performance of the farming sector, low efficiency and surplus capacity of the processing plants, and inefficient marketing strategies.

Several causes have been identified for this situation. Some examples are the inappropriate macro-economic environment within the country, the regional instability, the low world price of commodities, the sanitary status in relation to FMD (with an outbreak in 2001), and several other explanations related to the country, the international context, and the firms and chain strategies within the industry (Ilundain, *et al.,* 2002; Vega, 2001, COMISEC,1995).

Since the mid 1990s, the total volume of beef produced and the volume exported has increased considerably (Ilundain, *et al.,* 2002; INAC, 2002). These increments were the result of producers responding to good expectations generated by the opening of new markets after gaining the condition of free of FMD without vaccination, in 1996 (Lema, 2000). However, the price received from exported beef did not increase and the profitability of the firms participating in the industry has remained extremely low. Despite this awareness of the problems in the Uruguayan industry, a comprehensive analysis of the sources of competitive advantage or disadvantage has not occurred OPYPA, 2002. This study focuses on addressing this problem.

For New Zealand, the beef industry is less important than for Uruguay in relation to participation in total exports and use of resources (MAF, 2002). However, the industry constitutes an excellent complement for the sheep and dairy systems by using the farm resources more efficiently and by reducing the risk of relying on a single product. Similar to the Uruguayan beef industry, the New Zealand beef industry is facing problems in reaching high value markets in spite of its good sanitary conditions.

Therefore, there is a problem in relation to their international competitiveness. Both countries need to identify strategies for increasing their competitiveness and finding markets for high value products. The objective of this study, presented in the next section, aims to provide insights to help solving this problem.

1.5 - Objectives of this Research

This research aims to understand which factors have affected the international competitiveness of the beef industry in Uruguay and in New Zealand, with the final purpose of contributing useful information to the participants of the industry in increasing the international competitiveness. This general objective can be framed as three specific objectives, which are:

1. to identify which forces affect the international context of the Uruguayan and New Zealand beef industries
2. to identify the sources of competitive advantage for the Uruguayan and New Zealand beef industries
3. to compare the sources of competitive advantage for both industries.

1.6 - Scope of the Research

Since this study will analyse the beef industry in Uruguay and in New Zealand, it is important to clarify what 'beef industry" means in this context. In this research, beef industry is defined as being all sectors involved in the production, processing, distribution and sale of beef. There are different sectors in the industry - the livestock farmers, the meat processors (slaughter and processing), meat wholesalers and meat retailers - which are interconnected by a series of often volatile markets. These sectors and markets are linked by transport, and serviced to form a meat market channel which produces and delivers a group of products (hide, tallow, offal, blood and so on) and different types of beef (prime, manufactured, salted, and cooked beef). All these products have different prices and markets. This research focuses on studying the beef market channel since it is the most important product marketed in volume and value.

Furthermore, it is important to state that this study does not aim to suggest alternative strategies or recommendations for the beef industries in either country. Rather, it focuses on describing what is happening now in both countries. Therefore, in order to suggest new strategies it is necessary to undertake further studies. However, this research is likely to lay the ground for these further studies and also the information obtained from this study may help policy makers and managers in defining future strategies and policies.

The research problem could have been analysed from several perspectives, for example considering the different strategies that firms are applying, or the policies that favour or not favour the industry. However, this research focuses on studying the integration of factors that affect the environment where the firms and chains operate and how it affect the final performance of the industry. According to the objectives outlined in section 1.4 this thesis is organised as presented in the next section.

1.7 - Outline of the Study

This study aims to analyse and compare the factors affecting the international competitiveness of the New Zealand and Uruguayan beef industries. Chapter 2 reviews the relevant literature to find an appropriate theoretical approach to achieve these objectives. Chapter 3 explains the research design, data collection and analysis and presents the organisational framework used to carry out this research. Chapter 4 is the first chapter of results and discussion and presents an overview of the international context for the Uruguayan and New Zealand beef industries (related to the specific objective 1). Chapter 5 presents and discusses the results of Case Study 1, "The Uruguayan Beef Industry " and Chapter 6, Case Study 2, "The New Zealand Beef Industry". These chapters describe the industries, and identify the sources of competitive advantage in both industries, using the framework chosen in Chapter 2. Chapter 7 compares the sources of competitive advantage of both industries, and discusses and analyses the results from chapters 4 to 6. Finally, Chapter 8 summarises the thesis, presents the conclusions, implications and limitations of this study and outlines the relevant areas for future research.

CHAPTER 2

Literature Review

2.1 - Introduction

Chapter 1 introduced the research problem and its relevance, the objectives and the general outlines of this research. The objective of Chapter 2 is to search for an appropriate theory that could help identify factors affecting the sources of competitive advantage in an industry. According to Wood (2000), theories are necessary to define the background and the assumptions on which research is based. A theory can be defined as a supposition or system of ideas explaining something. It is often contrasted with facts, which is something that is known to have occurred. Without a theory the research is likely to be a collection of data which can only be used to explain observed data but are not applicable for future situations. (Wood, 2000). This chapter contains three main sections, which are briefly introduced in the following paragraphs, along with the logic of the sequence.

This literature review begins the analysis of industry success by focussing on traditional trade theory, starting with Adam Smith and includes several authors who have contributed and extended his theory, such as David Ricardo and Heckscher & Ohlin, among others. The traditional trade theories have provided valuable insights into the reasons for industry success and trade among countries. These theories were focused on countries' factor endowments and did not consider the role of firm strategy on industry success.

The following section of this chapter analyses the business management literature, including the most relevant literature regarding business and supply chain management. Although these theories have emerged from non-agricultural based industries, they have previously been used to understand agribusiness and agri-chains. These strands of literature provide useful information to identify firm and chains (group of firms) success, but the factors that lead to industry success in an international context are still missing.

Finally, the third section of the literature review introduces and describes Porter's Diamond Framework of a nation's competitive advantage. This framework was selected as the most appropriate theoretical framework for this research. It bridges the gap between the traditional trade theory (which focuses on the nation) and the business management literature (which focuses on firms or chains), and provides useful insights for analysing the international success of industries. This framework has been widely used and criticised, since it was published in 1990. The most relevant criticisms are presented at the end of this chapter.

2.2 - Traditional Trade Theory

There have been several theories that have tried to explain trade among countries, reasons for industry success and, hence, country wealth. Before the 18th century, wealth was considered in terms of gold and silver. Accordingly, in order to increase their wealth, countries accumulated as much of these materials as they could *(Mercantilism),* exporting as many manufactured goods as possible, and importing as few goods as possible. Trade was viewed as a zero-sum game in which a trade surplus in one country was offset by a trade deficit in another country. The government had an important role in the "*Mercantilism"* era, regulating international trade by encouraging domestic production (self-sufficiency) with high tariffs to import and subsidies to export, or by granting monopolies to certain industries in the country (Cho & Moon 2000).

Adam Smith, in his book "*The Wealth of Nations*", published in 1776, introduced a new concept of a nation's wealth and a new perspective about international trade, developing the basis of the traditional trade theory. Unlike Mercantilism theory, Adam Smith considered trade as a positive sum game where all trading partners could benefit if countries specialise in the production of goods in which they have an absolute advantage. Countries have an absolute advantage for certain products if an exporting industry can produce, with a given amount of capital and labour, a larger output than any rival located in any other country. Therefore, when a country is not able to be more efficient than any other country in any product, it has to import most of the products. Conversely, if a country had an absolute advantage for all these products, trade would not be necessary. Therefore, trade among countries enables them to increase their wealth (real income) by taking advantage of the division of work and specialisation (Ellsworth & Clark Leith,

1984). Adam Smith said that government intervention in international trade reduced the natural growth of the economic activity and market forces should be the ones regulating this process. Smith laid the groundwork for a free trade argument, since he emphasised that trade should be based on free exchange (Cho & Moon 2000).

Along the same line of thought, David Ricardo extended and contributed to Adam Smith's theory. In 1817, Ricardo developed the now familiar model, with two countries, two goods and a single input, labour. He extended the theory of absolute advantage to the theory of comparative advantage. According to Ricardo, market forces would allocate a nation's resources to those industries where it is, relatively, most productive in comparison to its trading partner. In this case, a nation may import a product even if it has the lowest cost of production, if it is more efficient at producing another good. Therefore, even if a country does not have an absolute advantage in any good, this country will still benefit from international trade. Ricardo considered only the labour cost[4] and the comparison was in the labour cost for the products that both countries were exchanging (Leamer & Levinsohn, 1995). David Ricardo's comparative advantage theory provided an important extension to Adam Smith's theory. However, he did not explain why the different efficiencies in labour appeared or why comparative advantages were different among countries (Ellsworth & Clark Leith, 1984).

In the early 20th century, Heckscher & Ohlin proposed that comparative advantage arises in countries from differences in the factor endowments that they possess (Ellsworth & Clark Leith, 1984). Goods differ from each other according to the factors that are required in their production and a nation gains factor-based comparative advantage in products that make intensive use of factors that it possesses in abundance. The Heckscher-Ohlin (HO) theory considered that differences in factor endowments among countries explains differences in factor costs, which result in different comparative advantages and hence in the products that each country is likely to export (Leamer & Levinsohn, 1995). This theory assumed that the available technology was identical among countries but that production methods were different because of different factor endowments and factor prices in each country. Patterns of production and trade, therefore, were explained by different factor endowments and factor prices. The HO

[4] Ricardo differentiated skilled labour from common labour by giving more value to the first than to the latter

model is simple, logical, makes sense and appears to be virtually self- evident. However, the HO model did not explain adequately what happens in the real world (Cho & Moon 2000).

An empirical study of the HO model conducted by Leontief (1953), regarding the pattern of trade in the United States (US), produced a paradoxical result. Considering that the US is a capital abundant country, according to the HO theory, it should export capital intense goods and import labour intense goods. According to Leontief's study, the US showed the opposite behaviour, importing goods requiring 30% more capital per worker than US exported goods. This finding was named the Leontief paradox. There have been some explanations about this paradox. Leontief himself argued that the reason for the paradox was that the US workers were much more productive than foreign workers (Cho & Moon, 2000).

Raymond Vernon (1966) provides another explanation to the Leontief Paradox in his product cycle theory. He argued that many manufactured goods go through a product cycle of introduction, growth, maturity and decline. Products require different factors according to the stage of the cycle of production they are in. It is possible that different countries are in these different stages at different periods in time, so the comparative advantage of these goods shifts over time from one country to another. An important contribution of the product cycle hypothesis is the assumption that the stimulus to innovation is provided by threats or opportunities in the market. Since the home market is the closest to the firms it is the most important driver for innovation and is also the preferred location for the country's production (Cho & Moon, 2000).

Another explanation was provided by Steffan Linder (1961) with his "country similarity theory". In contrast to most of the other theories, it deals with the demand side rather than the supply side. First, a country exports those manufactured products for which there is a significant home market. Second, the country exports products to other countries with similar tastes and income level. The most important theoretical contribution of this theory is its identification of two important variables, the domestic demand and the relevance of economies of scale (Cho & Moon, 2000).

The basic HO theory assumes constant returns to scale. However, there are economies of scale in most industries. Therefore, the existence of economies of scale can explain some patterns of trade that are not explained by the HO model. If there were economies of scale, countries or firms would benefit if they specialised in the production of a large quantity of a limited number of goods. Economies of scale are useful in explaining the trade of manufacturing goods among developed countries that may possess similar factor endowments (Cho & Moon, 2000).

Traditional trade theories have provided valuable contributions that are still useful for understanding some aspects of a nation's trade. However, they can not explain why countries with similar resources are competitive in different industries or why countries with scarce resources manage to be competitive in industries that use these resources intensively. Nowadays, trade among countries is higher than ever before, not only among the big economies such as the US, Europe or Japan, but also between small and big economies and also among poor, developing and developed countries. There is an extensive movement of products, from commodities to microchips, between countries with similar and different factor endowments. In today's complex world, the classic theories to explain trade among countries are no longer satisfactory. Adam Smith's and David Ricardo's theories, to name some of the landmark authors in trade economics, were very appropriate for their time, but they can no longer explain trade among countries.

2.2.1 - Summary

These trade theories related international industry success to factors related to the cost and availability of the country's factor endowments. But, nowadays, factors of production can move from one country to another and technological development has allowed some countries to overcome some resource restrictions. More recent contributors to this field have added other factors, such as the product's life cycle, country similarity and economies of scale, to explain reasons for trade and industry success. Although these theories, on their own, are not adequate to achieve the objectives of this research because they do not consider the effect of the firm's strategy on industry success, they provide useful insights, such as a focus on a country's resource base, to explain success in

exporting. The next section reviews the relevant literature in relation to the field of business management, seeking a different perspective for analysing the research problem.

2.3 - Business Management

The resources and strategies of the firms and chains that belong to a particular industry also contribute to the final performance of the industry. It is important to analyse the competitive strategy of the firms and chains in order to understand what factors contribute to the international success of the industry since the firms and chains are the ones that compete in the international arena. Related to the business management field, there is an exhaustive literature available and several theories have been developed to explain certain phenomena and, usually, there are different points of view about the same topic. This section only covers a small portion of this vast literature with the object of looking at the research problem from a different perspective from the traditional trade theory.

2.3.1 - Firm Strategy, Resources and Competitive Advantage

Barney (1996) defined strategy as a firm's theory on how to compete successfully. Firms gain superior performance when the strategies they apply lead the firm to competitive advantage. A firm is said to have competitive advantage when it is implementing a value creating strategy not simultaneously being implemented by any current or potential competitors. The competitive advantage is sustainable when it lasts a long period of time or it continues to exist after the efforts made by competitors to duplicate it have ceased (Porter, 1980) The sustainability of this positional advantage requires that the firm sets up barriers that make imitation difficult, but because these barriers are continuously overcome by competitors, firms constantly have to upgrade and innovate in order to maintain their competitive position (Day & Wensley, 1988).

To formulate strategies that lead the firm to competitive advantage, it is essential to relate the firm to its external environment (Porter,1980). The external environment consists of everything outside the organisation's control and it can be studied from two perspectives, the general environment or the competitive environment. The general environment consists of all the factors that are external to the firm and to the industry where it belongs.

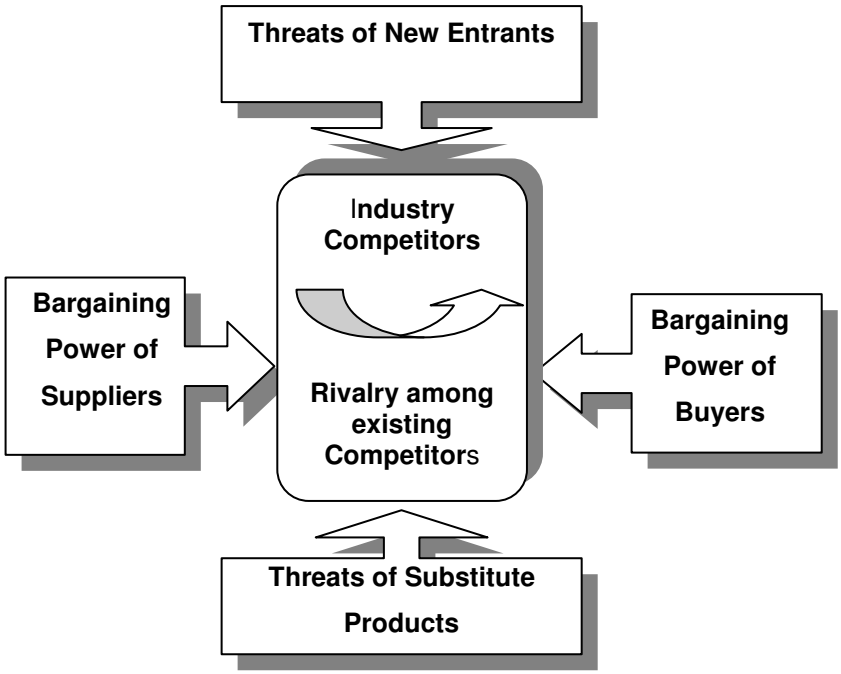
The general environment can be structured according to six dimensions: global, macro economic, political-legal, demographic, socio-cultural and technological. The general environment is not related to the characteristics of the particular industries and affects all the industries (Miller, 1998). In contrast, the competitive environment is represented by the industry in which the firm competes. Therefore, the actual performance of the firm will depend on both the strategies that the firm implements (competitive strategies) and also on the characteristics of the industry where it operates (level of competition in the industry) (Porter, 1980).

An industry can be defined in several ways. The traditional definition of an industry focuses on cross elasticity of demand among a set of firms. This means that when increases in the price of one firm's products or services lead to an increase in demand for another firm's products or services, these two firms have a high cross elasticity of demand and can be thought of as being in the same industry. Simplistically, two firms belong to the same industry if they produce similar goods or services (Barney,1996). In addition, Porter (1980) defined an industry as a group of competitors producing products or services that compete directly with each other.

The potential performance of firms in any industry depends on the nature and degree of competition existing in the industry. According to Porter, (1980) the competitive environment or the level of competition within an industry is affected by five forces as described in Figure 1. The stronger the forces the higher the level of competition in the industry. Several factors affect the intensity of each of these forces. *Threats of new entrants* depend on the barriers to new firms entering the industry. These barriers depend on the economies of scale, product differentiation (e.g. brands), capital requirements, cost disadvantage, access to distribution channels, and government policy. *The bargaining power of buyers* depends on the power that the buyers possess. Buyers are said to have power when they buy high volumes of a certain product, they purchase standardised or undifferentiated products, the product they purchase is only a component of their product, the quality of the product is not important for the quality of the buyer's product, or it is possible for them to integrate backwards and make the product that they are buying, by themselves. *The Bargaining power of suppliers* appears when there are few firms that supply that product, the product they supply is unique or differentiated, the buyer is not an important customer for the supplier firm, and there is a high threat of integrating

forward into the industry business. *Rivalry among competitors* is high when there are numerous competitors of equal size and power, industry growth is slow and, hence, market share, lack of product differentiation, and the exit barriers are high.

Figure 1: Five Forces Driving Industry Competition



Source: Adapted from Porter (1980)

Those forces can be intense in industries where no firm earns high returns or relatively mild in industries where firm's high returns are quite common. It is necessary to identify these forces in any industry so that the firm can identify its strengths and weaknesses in comparison with the other competitors in the industry (Porter, 1980). Industry attractiveness depends on the level of opportunities and threats in an industry and affects the potential performance of the firms in the industry. Highly attractive industries have high opportunities and low threats for the firms in the industry, so it is possible to have high level of performance. In contrast, highly unattractive industries have low opportunities and high threats and hence these firms are likely to achieve only low levels of performance (Barney, 1996).

The Structure-Conduct-Performance (S-C-P) framework, is a theoretical framework developed by economists in the 1930s for understanding the relationship between a firm's environment, its behaviour (strategy) and its performance. The structure refers to the

industry structure, measured by such factors as the number of competitors in an industry, the heterogeneity of products and the cost of entry and exit. Conduct refers to the specific firm's actions in an industry, including price taking, product differentiation, tacit collusion and exploitation of market power. Finally, performance is related to individual firms (normal, below normal or above normal) and to the country (productive efficiency, level of employment, progress) (Barney, 1996).

The forces in the external environment influence all firms in the industry, but different firms apply different strategies to deal with these forces and, hence, they achieve different performances. There is no one universal competitive strategy, only strategies tailored to the particular industry and to the skills and assets of a particular firm (Barney, 1996).

There are three "generic strategies" that firms can follow, singly or in combination, to compete with the other participants in the industry in order to obtain a sustainable competitive advantage (Figure 2). These generic strategies - cost leadership, differentiation and focus- enable firms to cope with the five competitive forces present in any industry (Porter, 1980).

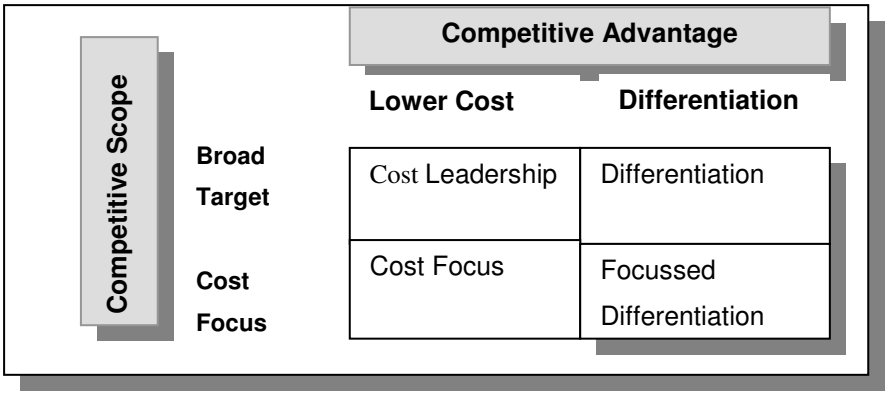
Firms that develop strategies for *cost leadership* may compete better in the market than other firms. A low cost position may protect the firm against powerful suppliers and buyers and position firms in a more advantageous situation than their competitors. In addition, cost leadership increases barriers to entrance and decreases the threats of substitute products. There are some risks associated with cost leadership strategies, for example, technological changes may become obsolete investments and learning acquired to reduce costs. Also imitation by competitors and the inability to recognise changes in product requirements because of the low cost focus, are risk associated to low cost strategies.

The second generic strategy refers to *differentiating the product or service* offered by the firm with some characteristics that are perceived to be unique. The customer needs to recognise that the product has a greater value because of its unique characteristics and be willing to pay more for this value. Some differentiation strategies can be related to creating brand image and customer service or dealer networks. Differentiation strategies also pose some risks, such as the difference in price between the differentiated product

and the competitor's product becoming so high that consumers are no longer willing to pay this higher price. Another example of the risk of differentiation is that changes in consumer preferences or imitations by competitors may cause differential attribute of the product obsolete.

Finally, *the focus strategy* refers to servicing only a target portion of the market (e.g. a particular buyer group, a segment of the product line or geographic market) with a low cost product or a different product but only for this particular segment of the market. It is different from the other strategies that aim to reach the whole industry by applying cost leadership or differentiation strategies. When applying a focus strategy there are some limitations about market share achievements.

Figure 2: Generic Strategies to Obtain Competitive Advantage



Source: Adapted from Porter (1985)

Porter (1985) argues that there are some risks of getting stuck in the middle when a firm tries to follow more than one strategy, therefore, their profitability is likely to be low if firms try to accomplish more that one of the three strategies.

Barney (1991) argued that one shortcoming of Porter's view is the inability to explain different performance of firms that are in the same industry and are performing the same strategy. Grant (1991a) stated that a firm's resources and capabilities are the central considerations for formulating its strategy and this is where the sources of profitability are. According to the resource-based theory of the firm, there are some resources that the firm possesses that may be potential sources of competitive advantage. Firms' resources are all the assets, capabilities, competencies, organisational processes, attributes,

information and knowledge that a firm controls and that enable it to implement strategies that improve its efficiency and effectiveness. Generally, these resources are divided into four categories, financial, physical, human and organisational capital (Grant, 1991a).

For these resources to be a source of competitive advantage they have to be valuable, rare and costly to imitate. A firm's resources and capabilities are valuable when they reduce a firm's cost or increase its revenues compared to the case if this firm did not possess them; they are rare when few firms possess them; and they are costly to imitate when the firms that do not possess them face a cost disadvantage in obtaining them compared to firms that already possess them. Finally, it is not only important to have valuable, rare and inimitable resources, but it is also necessary to have the firm's structures and strategies aligned with these resources (Barney, 1996).

Barney (1996) presented an analytical framework that can be used to analyse the competitive position of the particular firm based on the strengths and weaknesses of its resources and capabilities. He expanded Porter's work by providing some indications of how a firm can create a defendable position in facing the five forces of competition based on their resources.

2.3.2 - Value Chain

To analyse competitive advantage and its creation it is necessary to consider the many activities a firm performs in designing, producing, marketing, delivering and supporting the product. Porter in 1985, introduced the "*value chain"* framework as a tool to analyse how competitive advantage can be gained when firms perform these activities. According to this framework, firms can be divided into a series of separate activities which form *"the firm value chain "*. These activities are divided into two groups, primary activities and support activities. The primary activities are related to the manufacture and distribution of the product. This group includes inbound logistics, production, outbound logistics, marketing and services. The support activities accomplish the primary activities of the firm and include infrastructure activities, technology development and human resources management and development. The firm value chain is embedded in a larger stream of activities, known as "*value system"* (Porter, 1985).

Initially, Porter developed this concept of a value chain as applied to a firm. However, other authors extended this framework to analyse all the firms related to the creation of value[5] in a product, such as Barney (1996) with his concept of a *"product value chain"*. The product's value chain can be defined as the value created by the set of vertically related activities that are carried out to move the product from the supplier of raw materials to the end consumer. This is similar to the value system (defined by Porter) which includes the value chain of all the participants in the process to produce the product. Gaining and sustaining competitive advantage depends not only on how firms perform these activities in the firm's value chain, but also on how the other firms in the value system perform them and on how each firm is co-ordinated with the other firms in the system (Porter, 1985). This concept is closely related to the *Supply Chain Management* approach that is presented in the following section.

2.3.3 - Supply Chain Management

The previous sections presented some of the most relevant strands of literature in relation to gaining competitive advantage at the firm level. This section discusses how a group of firms (a supply chain) can obtain competitive advantage. The supply chain is the group of firms that intervene in moving the product from first supplier to the end consumer. Supply chain management grew out of the logistic literature, which focussed on the transformation and movement of products from input suppliers to end consumers. However, it has been recognised that much more occurs in a chain than the movement and the transformation of goods. There are three main components, product flows, information flows and changes of product ownership (Taylor, 1997).

Supply chain management is a new way of managing production and distribution systems that considers all the organisations that integrate the supply chain. According to Bowersox *et al.* (1999) this strategy includes planning, implementing, and controlling the efficient and effective sourcing, manufacturing, and delivery process for products, services and related information from the point of material origin to the point of ultimate consumption. The supply chain management approach involves the integration of several processes along the organisations within the supply chain, from first supplier to end

[5] Porter, (1985) defined value as the amount of money that buyers are willing to pay for the product that the firm provides them. Hence, the firm's profit depends on the relationship between the product's value and its costs. A firm is profitable if the value that it creates is higher than the cost to produce it.

consumer, to generate a higher relative value for the purpose of conforming to the end-customer's requirements (Bowersox, *et al.,*1999; Tan *et al.,* 1998). This new concept reflects the evolution from firm to firm competition to system versus system competition (co-operate to compete) (O' Keefe, 1998).

The implementation of supply chain management strategies results in firms developing sustainable competitive advantage due to a more efficient movement of products and information and to the difficulty of competitors imitating an integrated supply chain (Tan *et al.,*1998; Mentzer, 1993; Bhattacharya, *et al.,* 1996; Lambert, et.al., 1996; Towil & Eng, 1996; Anderson *et al*., 1997). This higher efficiency minimises the chain costs, asset inventory, and production time, and maximises efficiency gains, and customer satisfaction, through the offer of added value products and services (Bowersox *et al.,* 1999).

According to the supply chain management approach, developing co-operative relationships between the participant firms in the chain (such as partnerships and strategic alliances) is one of the keys for obtaining an effective and efficient integrated supply chain (Lambert, *et al*., 1996; Bowersox, *et al.,* 1999; O'Keefe, 1997). In the last 10 years, the development of co-operative models of integration such as partnerships and strategic alliances has been a common feature in the behaviour of firms seeking competitive advantage (Wilson, 1995; Ohmae, 1989). This behaviour has also been observed in agribusiness. The pork and poultry industries in the US are most representative of this behaviour with the development of integrated chains from the first input supplier to the supermarkets (Boehlje & Sonka, 1998).

2.3.4 - Summary

The literature review on management theory suggests that firms can be competitive by applying the appropriate strategies to face the environment and to take advantage of the resources that they possess. These streams of literature provide useful insights into understanding firm success and what makes a firm competitive. The supply chain management literature adds to this understanding in relation to the creation of competitive advantage in a supply chain. As such, this literature provides perspectives that are helpful in understanding the research constraints. However, because this research

aims to study competitiveness for the whole industry it provides an incomplete approach. The literature reviewed so far has shown how firms and group of firms (supply chains) could obtain competitive advantage. An industry contains, but is not limited to, firms and supply chains. It is necessary to establish a link that shows how firms seeking competitive advantage can lead to industries gaining competitive advantage, Therefore, it is necessary to gain a wider perspective focussing on industry success. The next section presents and describes Porter's diamond model of a nation's competitive advantage, which analyses which factors affect the international success of industries.

2.4 - Porter's Diamond Framework

According to Porter in his book "*The Competitive Advantages of Nations",* published in 1990, countries are more likely to succeed in industries or industry segments where the characteristics of the country provide the most favourable environment for the firms within the industries to upgrade and innovate. Countries will export and succeed in international markets in the industries that they have a competitive advantage in. The key issue is to know which factors affect the competitive advantage of the firms within the industries.

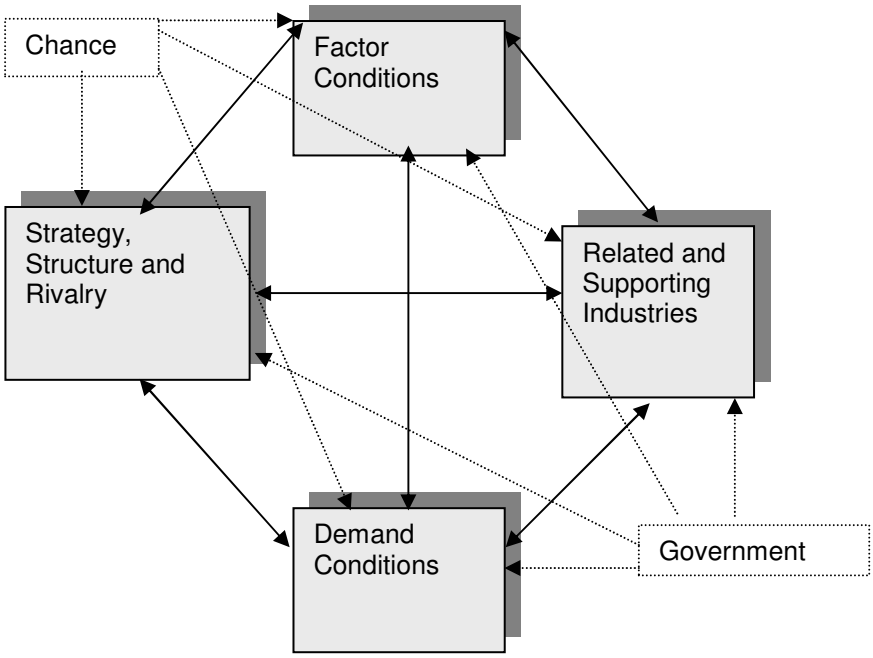
Porter argues that there are several attributes of a nation that affect the competitive environment in which firms compete and that can promote or prevent the development of competitive advantage . It is important to know which characteristics of a nation may lead to success in a particular industry so managers and policy makers can enhance these factors. Under this framework the unit of analysis is the industry since the characteristics of the country affect the whole industry and not particular firms. However, the firms and chains are those that obtain competitive advantage.

This framework emerged after four years of studying several industries in ten important trading nations, namely, Denmark, Germany, Italy, Japan, Korea, Singapore, Sweden, Switzerland, United Kingdom and the United States. When Porter published his book it received international attention from academics, politicians and the business community. It has been widely used in country and industry studies. In addition to the 10 countries

where the model was developed, two other country studies in New Zealand[6] and in Canada[7] were subsequently developed by Porter and his collaborators. There have been also several other applications of the model in different countries such as in Austria (Bellak and Weis, 1993), Finland (Yla-Antila, 1994), Turkey (Oz, 2000) and Saudi Arabia (Jasimuddin , 2001). There have also been several industry studies such as the petroleum and automobile clusters in Mexico (Hodgett, 1993), financial service marketing in Japan (Turner, 1994), the Irish shellfish processing industry (Ryan, et al., 1999), and the Danish tourism industry (Lyck, 2002), among others.

Porter's theory considered four factors as critical in stabilising the competitive advantage of any industry within a country. These determinants are factor conditions, demand conditions, firm strategy, structure and rivalry; and related and supporting industries. He also considered two external factors; chance and government that are likely to affect the four components. Figure 3 shows Porter's Diamond Framework.

Figure 3: Porter's Diamond Framework



Source: Adapted from Porter, (1990)

[6] Crocombe Enrigth and Porter (1991) "The Porter Project" with an exhaustive analysis of the competitiveness of New Zealand.

[7] By Porter's Monitor consulting firm in Canada.

These four determinants shape the industrial environment to the benefit or hindrance of a nation's firm by providing the firms the pressures, incentives and capabilities to undertake improvement and innovation. This is an holistic approach with an important level of complexity because it has a combination from different disciplines such as technology innovation, industrial economics, economic development, economic geography, international trade, political science, and industrial sociology, that are not usually combined. Sections 2.4.1 to 2.4.6 explain the components and interrelationships of the framework.

2.4.1 - Factor Conditions

Factors conditions refers to the relevant inputs necessary to compete in an industry such as physical resources (arable land, climate, location etc.), human resources (labour cost availability and level of skills), knowledge resources (number of scientists, research centres, databases etc.), capital resources (cost and availability of capital) and infrastructure (type , quality and cost of infrastructure).

Factors can be divided into basic factors and advanced factors. Basic factors are those which have been inherited or created with a low investment, for example, natural resources, climate, and low skilled labour. Advanced factors are those which require high levels of physical and human capital investment, such as research institutes or sophisticated infrastructure. Factors can also be divided into generalised and specialised. Generalised factors are those that can be used by a range of industries. Specialised factors are those that are relevant to a limited range or a single industry. According to Porter, the most significant and sustainable competitive advantage results when a nation has factors needed to compete in a particular industry that are both advanced and specialised. Conversely, when competitive advantage is based on basic and generalised factors they are easy to imitate, hence, they are a less sustained source of competitive advantage. Porter claimed that the most important factors for modern industry are created. In order to obtain competitive advantage, it is not the level of resource at a certain point in time, but the rate at which they are generated and upgraded that is most important.

Unlike previous theories of international trade, where abundant factors of production were a source of advantage, Porter suggests that the competitive advantage for a

particular industry in a country can grow out of disadvantages in some factors. That is, he claims that a shortage in factors of production could be the motivation, for particular firms, to create a new way to overcome this shortage. Hence, this shortage may be transformed into a competitive advantage when innovation to circumvent selective disadvantage not only economises on factor utilisation but can also create new factor advantages.

2.4.2 - Demand Conditions

Another important factor in creating sustainable competitive advantage for the industries in the country, included in Porter's Diamond Framework, is the demand conditions. Porter found that the characteristics of the home demand had some influence in nearly every industry he and his colleagues studied. The characteristic of the domestic demand is important for two reasons. The first reason is the effect on economies of scale in relation to the size of the market. The second reason is its effect on improvement and innovation within the country when domestic market consumers demand new and better products. Sophisticated and demanding home market consumers will pressure the firms in the country to satisfy them and, hence, to innovate.

There are three important aspects of home demand that are relevant for industries developing competitive advantage. The first aspect is home demand composition, including segment structure of demand, sophisticated and demanding buyers, and anticipatory buyers needs. The second aspect is demand size and pattern of growth, including size, rate of growth, early home demand and early saturation. The final aspect is internalisation of domestic demand, including mobile or multinational buyers and their influence on foreign needs.

2.4.3 - Related and Supporting Industries

Another important determinant of national advantage is the presence of world-class related and supporting industries in the country. Related industries are those that share common technologies, inputs, distribution channels, customers, or provide products that are complementary. World class related industries could provide a nation's firms with sources of technology, ideas, individuals and potential competitors that can become advantages for international competition. Supporting industries are those that provide

inputs to the industry, such as technology, information, and raw materials. The presence in the country of a world leading supporting industries can be a source of competitive advantage because these supporting industries can provide early, rapid and preferential access to the most cost effective inputs. Linkages and co-ordination strategies with these supporting industries can be a source of competitive advantage and they may help in the process of upgrading and innovation.

Nations, typically, are competitive in "clusters" of related and supporting industries connected through vertical and horizontal relationships. Clusters are geographic concentrations of interconnected companies, specialised suppliers, service providers, firms in related industries, and associated institutions (for example universities, standards agencies, and trade associations) in particular fields that compete but also co-operate. The clusters present in the country reflect the state of the economy's development, and they are an essential ingredient of the economic development of the country (Porter, 1998).

The complex web of interactions within these clusters can provide a major source of competitive advantage throughout the entire economic system. Often the clusters are geographically concentrated, making the interactions closer and more dynamic. It is more difficult to obtain the same level of interaction with related and supporting industries when they are located in foreign countries, than when they are located in the same country.

Clusters affect competition in three ways. Firstly, they can increase the productivity of firms or industries. Secondly, they can increase their capacity for innovation and, hence, for productivity growth. Finally, they can stimulate new business formation that supports innovation and expands clusters (Porter, 1998). Clusters may be viewed as relating to one facet of the diamond, "related and supporting industries", but they are best seen as a manifestation of the interactions among all four parts of the diamond (Porter, 1990)

2.4.4 - Firm Strategy, Structure and Rivalry

Firm strategy and structure relates to the conditions in a country that govern how companies are created, organised and managed. Many aspects of a nation influence ways in which firms are organised and managed. Some of these include social norms and

attitudes towards business, which are often reflected in government policy. Generally, it depends on the educational system, social and religious history, family structure and other unique national conditions. In addition, the socio-political environment has an impact on the type of industries in which a particular country achieves international competitiveness.

A firms' rivalry refers to the nature of their domestic competitors. The nature of competition and the presence of local rivals have a fundamental impact on the international competitiveness of a nation's firm. The presence of local rivals is a powerful stimulus for the creation and persistence of competitive advantage. This internal rivalry encourages firms to make investments and take risks to create new competitive advantages. Competing with foreign companies also helps to increase competitiveness. However, competing with domestic rivals is most helpful in the process of upgrading and innovating since these firms are under the same country's environment.

2.4.5 - External Factors: Chance and Government

Two additional determinants may affect the national environment, namely, chance and government. Chances are events that occur outside the control of the firm and, often, the national government. These events include pure inventions, breakthroughs in basic technologies, wars, and external political developments. These events are important because they create discontinuities that allow shifts in the competitive position. Chance affects the competitive position by affecting the four determinates of the diamond.

Governments can also affect competitive advantage by promoting or preventing industry development. Traditional theories of international trade see the government as the most influential factor in modern competition. However, Porter said that the most important role of government is in influencing the four determinants, either positively or negatively. As an example, subsidies, policies toward the financial markets or education may affect factor conditions in a country. Another example can be regulations and local standards imposed by the government which may affect demand conditions. Government also affects the sources of competitive advantage by its effect on the four determinants.

2.4.6 - The Determinants as a System

Porter proposed that the diamond has to be considered as a system where all the corners interact with each other. Competitive advantage cannot be obtained if only one corner of the diamond is favourable and the others do not enhance this source of competitive advantage. Similarly, the two external factors affect, in different ways, each of the four determinants of the diamond. Consequently, it is necessary, when using the framework, not only to analyse the effect of the determinants but also to consider their interactions with the other corners and the external factors.

2.4.7 - Summary

According to Porter the sources of competitive advantage of any industry within a country emerge from the interaction of four main determinants, factor conditions, demand condition, supporting and related industries and firm strategy structure and rivalry, and also on the effect that two external factors, chance and government have over these four determinants. All these components constitute a diamond. According to Porter, when a country has a favourable diamond for a particular industry it is likely that this country is internationally successful in this industry. A favourable Diamond for obtaining competitive advantage means that its components in the country are appropriate for the firms to have an environment to upgrade and innovate and/or it possesses an adequate pool of resources relevant to the industry. With regard to the research problem being addressed in this study, if the diamonds for Uruguay and New Zealand in relation to the beef industry are described and analysed, the sources of competitive advantage can be identified and compared, which is the main objective of this thesis.

The last sections described Porter's diamond model and presented the framework as useful for the research. The next section summarises the main criticisms that have appeared since the framework was published, since knowing the main weaknesses of the framework when applied in different situations helps to analyse the suitability of it for this particular research.

2.5 - Criticisms of Porter's Diamond Model

Grant, (1991b) and O'Connell *et al*., (1999) have argued that Porter's book " The Competitive Advantage of Nations" has been considered the most influential book for firm managers and policy makers in the last decades. Davies & Ellis (2000) reported that more than 30 reviews of the book and nearly 50 articles have been published since then, presenting arguments for and against the framework and, as can be appreciated in the following quotations, the opinions have been quite divided.

"Gloriously rich but hopelessly intractable" (Grant, 1991b)
"Hopelessly rich but gloriously wrong" (Davies & Ellis, 2000)

The significance of the model can also be appreciated by the amount of criticism it has raised. After Porter's Diamond Framework was published, the theoretical base and methodology, logic of its arguments, its predictive power and its applicability have been severely criticised (Cartwright, 1993; Grant, 1991b; Davies & Ellis, 2000; O' Connell, *et al.,* 1999). Since this framework appears to have potential in meeting the objectives of this research the main critiques that are relevant for this study are addressed, to identify possible limitations, and to analyse the suitability for this research problem.

2.5.1 - Theoretical Base and Methodology

Several criticisms have been made about Porter's Diamond framework's theoretical base. Some terms such as competitiveness (Davies & Ellis, 2000), cluster and clustering (O'Connell, *et al.,* 1999) have been poorly defined and other authors have argued that the relationship between upgrading and sustainable competitive advantage was not clear (Grant, 1991b; O'cornell, *et al.*, 1999). With regard to methodology, it was argued that conclusions were obtained in an unspecific manner so it is impossible to test their validity (Davies & Ellis, 2000; Grant, 1991b; Cho & Moon, 2000). O'Connell, *et al*., (1999) have also pointed out that Porter did not have a set of prior hypotheses to be tested, which make difficult to trace back how the conclusions were drown.

2.5.2 - Logic Behind its Arguments

There have been some critiques regarding the components of the Diamond (Grant, 1991b) and some modifications were proposed. Ryan, *et al*., (1999) studied the fishery industry in Ireland and they suggested that the European Union should be incorporated as a third exogenous variable because of the strong influence it has on both the government policy and the industry. Van de Bosh & Van Proijen, (1992) emphasised the need to incorporate the effect of national culture to analyse the competitive advantage of nations. Similarly, Jasimuddin (2001) proposed that any application of the model needed the incorporation of a qualitative assessment of the cultural, social and educational factors that contribute to economic success or failure.

In relation to the logic of the Diamond, several opinions have emerged. Grant (1991b) claimed that Porter‘s assertion that natural resources are not a strong source of competitive advantage was wrong because some of the latest generation of technology can be easily imitated by competitors. In contrast, some competitive advantages based on basic factors of production, (e.g. oil resources in Saudi Arabia), are more difficult to imitate (Jasimuddin 2001). It has also been claimed that 15 of the 25 top industries in the US that are successful, owe this success to their basic factor endowments (Grant, 1991b).

Another criticism relates to the fact that Porter correlates industry success directly to the level of rivalry among domestic firms because it constitutes a strong stimulus for innovation. However, domestic rivalry as a source of competitive advantage does not sit easily with the co-operative arrangement and alliances among companies that has been widely recognised as a source of competitive advantage in many industries (O’Connell *et al*., 1999; Ryan, *et al*., 1999). In 1992, Dryden Spring who was the Chairman of the New Zealand Dairy Board, disagreed with the recommendations made by Porter about the need to create more internal competition in the New Zealand dairy industry and dismantle the New Zealand Dairy Board as a way of increasing the competitiveness of the dairy industry in New Zealand.

Daly (1993) criticises the omission of the exchange rate in the model, and analysed the effect of the exchange rate on competition. He emphasised the importance of incorporating macro-economic variables into the model since the effect of these variables

on competitiveness is undeniable. Daly stated that Porter has a micro-orientation in his research because of his previous work in industry strategy. The author suggested that the competitive position between Japan and United States has been based, mainly, on exchange rate and wages differences. In addition, Daly stated that the exchange rate is more important for small countries because they are generally export based and most of the time they are price takers because they only account for a small share of the market. Therefore, changes in exchange rate or in world prices for the product are more important for their industries and he recommended that it would be more appropriate to combine the micro economic focus of Porter's framework with a macro analysis of major prices and exchange rate.

2.5.3 - Predictive Power

Several authors have agreed that one of the most limiting factors of the model is said to be its predictive power (Davies & Ellis, 2000; Grant, 1991b). In most of the situations reported, the model was assumed to be valid and only a few studies have tried to test empirically its validity. Some of these tests have been done by Cartwright (1993) in New Zealand and Moon *et al.*, (1998) in Singapore and Korea. In these three cases, Porter's Diamond Framework was not adequate for predicting the behaviour of the industries in these countries, and some modifications were proposed.

Cartwright (1993) tested the theory with data from resource-based and export dependent industries in New Zealand. The resource based and export dependent industries are characterised by output that is much larger than the domestic demand and their value chains are linked to immobile land resources. In these industries the logic of the original study has been severely questioned associated with two reasons. One reason is related to the role of the home country as the only one affecting the competitive advantage of the industry. Another reason is related to which factors of productions are relevant for developing competitive advantage.

Cartwright (1993) conducted his analyses in two group of industries, *Group 1*[8], which had five industries with a strong position of international competitiveness and increasing

[8]Casein and whey protein, whole milk powder, fresh apples, fresh kiwifruit, venison portions.

profitability, and *Group 2*[9] which had six industries with a moderate position of international competitiveness and static or declining profitability. Interval scales were used to measure the strength of each corner of the Diamond for each industry, based on the author's judgements and two hypotheses were tested statistically. The correlation coefficient showed that the diamond analysis predicted a stronger international competitiveness for less competitive industries *(Group 2)*, than for industries that were actually strongly competitive *(Group 1)*.

The low predictability of the model in relation to New Zealand was ascribed by Cartwright to the fact that Porter insisted that the sources of competitive advantage must be home based. However, the firms in *Group 1* are committed to both exporting and off-shore investment and innovation. In these markets they are stimulated by discerning customers and strong rivalry and they receive support from related industries. In addition, the industries in G*roup 1* have adapted co-operation and co-ordination strategies to achieve economies of scale and scope to increase bargaining power in international operations. This is in contrast to Porter's argument that strong rivalry is the base for competitive advantage and that firms should concentrate on the local market first. However, for firms in the *Group 1*, the local market represented only 3% of the products their commercialised.

To overcome these shortcomings of the model and its low predictive power, Cartwright proposed a multiple linked variable that included some off-shore variables. These off-shore variables were, (a) capture of factor creation, (b) linkage of related and supporting industries in the off-shore environment, (c) access to demanding customers and rivalry in off-shore markets, and (d) the extent to which the industry has international goals and structures. Two Models were created and tested, *Model 1*: including the off-shore variables, and the domestic diamond and, *Model 2:* including the off-shore variables only, while ignoring the home-based diamond.

The results of this research were as follows. For *Group 1*, both extended models improve the explanation of international competitiveness. Moreover, *Model 2* explained competitiveness better than *Model 1.* For *Group 2*, both models reduced the level of fit.

[9] Lamb, beef, wool, goat fibre, pulp and paper, saw logs and timber.

Cartwright suggested that for industries with an important market share in the international market, the double diamond (or multiple linked diamond) would be more suitable.

Rugman (1991) also criticised the suitability of using Porter's Model in the Canadian situation. The main failure of the Porter's model, according to Rugman, was the way in which Porter considers foreign direct investment (FDI) and the role of multinational enterprises (MNEs) and he suggested that the recommendations made for Canada were wrong and could lead to misplaced policy initiatives. Porter said that the MNEs depend on the characteristics of the home base country. However, that explanation does not appear adequate for small trading countries such as Canada and New Zealand because the characteristics of the country where the subsidiaries are allocated are also important (Cartwright & Nonkivel, 1992; Rugman & Verbeke, 1993; Bellak & Weis, 1993; Cho, 1998).

Rugman & Cruz (1993) maintained that each country needs to set its own home country diamond against the relevant triad diamond. In general, most Asian and Pacific countries should set their diamond against Japan. On the other hand, Canada, Mexico, South American countries and the Caribbean countries should consider their diamond against the US diamond. The European nations outside the EU, should set theirs against the EU. The authors argued that Porter's model explained the success of the US, Japan and the EU based on multinationals corporations, but that this is not applicable to small, open, trading economies that are not part of this triad.

Dunning (1992) also stated that countries different from the home base nation are important for the global competitiveness of the MNEs. He concluded that the proximate environment of an MNE or industry may include more than one nation and that in some cases, such as Canada, the diamond of one particular foreign country is a relevant as those of the home country.

Rugman & Verbeke (1993); Rugman & Cruz (1993); Narula (1993) stated that Canada should use a double diamond including the US. It implies that firms that compete internationally in the US should include the US diamond in the analysis. It is argued that the single diamond is misleading for managers of multinational enterprises operating in

small open trading economies such as Canada and New Zealand and that double diamond is essential to develop international competitiveness.

Similarly, Hodgetts (1993) also criticises Porter's treatment of the multinational enterprises and foreign investment in analysing the Mexican situation. In this study, the author includes a modification of the model considering a double diamond Mexico – US because of the big influence of the US market in the Mexican economy. Finally, Moon, *et. al.* (1998), who tested empirically a double diamond model in Singapore and Korea, proposed a generalised double diamond model.

Porter emphasises the role of the home nation on firm performance, because it is in its immediate environment. However, the tests that were undertaken in New Zealand, Canada, Singapore and Korea showed that there are other countries different from the domestic nation that were necessary to consider. All these authors share the idea that double / or multiple linked diamonds may affect the sources of competitive advantage better than Porter's single Diamond Framework.

2.5.4 - Applicability

The applicability of Porter's Diamond Framework has been criticised in relation to its suitability in developing countries by Narula, (1993). He stated that the model was developed based on a subjective analysis of a few industrialised countries and it can not be successfully applied in developing countries. In contrast, Oz (2000) who analysed the competitiveness of Turkey, said that Porter's diamond model worked well for developing countries. However, he found contradictory results in two particular points of the diamond, these being the relevance of domestic firm rivalry and the role of government. With regard to domestic demand he argues that, for developing countries, it is not an important factor as was stated by Porter. In addition, for a developing country, which is in an early stage of economic development, the role of the government on the competitiveness of the industries is higher than it was predicted by Porter, when he studied the developed nations.

Finally, it has been argued that the model is not suitable for policy recommendations at a national level because of the micro-economic approach of the theory (Grant, 1991b).

Consequently, it is claimed that recommendations for government policies are in doubt and the analysis is not adequate to explain economic development at a national level (Grant, 1991b; Jasimudin, 2001; Rugman, 1991; Weihrich, 1999).

2.5.5 - Summary

Several criticisms have appeared since the framework was published, only some of them were presented in the previous section. One of the most relevant criticisms of the framework is related to the importance of considering an off-shore diamond as well as the home diamond. It was suggested mainly when analysing the sources of competitive advantage in small and export oriented countries such as Uruguay and New Zealand.

2.6 - Selecting the Framework

It has been suggested that the main contribution of the model is that it bridges the gap between international economics theory and strategic management theory, providing contributions for both (Grant, 1991b; O'Connell *et al*., 1999). The main contribution to the international economic theory was in combining several previous theories to explain, more effectively, the observed patterns of trade between countries. Porter managed to integrate the ideas from previous theories, for example, the factor conditions determinant gives prominent importance to the factor endowments as cited in the Heckscher & Ohlin theory and the demand conditions determinant links the size of the domestic demand with competitive advantage, as in theories of country similarity, economies of scale and the product life cycle theory (Cho & Moon, 2000). However, unlike these previous theories, Porter specified more exhaustively the type of factors in its factor condition determinant including several categories, and in the demand condition determinant he incorporated new elements in comparison to previous theories, such as the pattern of growth, segment composition, sophistication and early saturation (Grant, 1991b; Davies & Ellis, 2000; Cho & Moon, 2000). It has been argued, that the broader scope of Porter's model makes it more suitable to explain trade in the real world, unlike previous theories which have been too narrowly focussed (Grant, 1991b).

In the strategic management field the framework has contributed in shifting the focus of the competitive theory (in which Porter has been the main contributor) from the firm to

the nation (Grant, 1991b; Davies & Ellis, 2000; Cho & Moon, 2000). In addition, at the firm management level he contributes by integrating Schumperian approaches with competition and resource based approaches to strategy, resulting in a consensus within the strategic management veins of literature (Grant, 1991b). Porter proposed, in his framework, that competitive advantage could be obtained when factors are advanced and specialised. This view agrees with the resource based view of the firm, in which competitive advantage is based on valuable, rare and costly to imitate resources.

Porter's analysis spans three levels of aggregation – the firm, the industry and the nation. The most important contributions are at the industry level and how these national factors affect individual industries (Grant, 1991b). Therefore, it constitutes a useful framework which could be used to look at the research problem since this includes and combines national and firm aspects that may affect the international success of the industry.

Despite these criticisms, it is undeniable that Michael Porter has been one of the most influential researchers in the strategic management field. He has provided the elements to analyse competitiveness at different levels, firms, industries, regions and nations. Despite all the criticisms that have appeared after publishing his book, *"The Competitive Advantages of Nations"* in 1990 it has been widely used in many countries, industries and locations studies. His impressive scholarship in putting together the four elements of the Diamond provides a useful guide for analysing the sources of competitive advantage in any industry. Therefore it was selected as the theoretical framework for this research.

2.7 - Chapter Summary

The objective of this literature review was to find an appropriate theoretical approach for framing the research. Various theories can cast some light on the research problem. Both the traditional trade theory and the management literature have something to contribute to the research problem; however, they offer only partial approaches because they have focussed on the nation and the firms, respectively. The most promising theory to use as a basis for the research is Porter's Diamond Framework to assess competitive advantage of nations. This framework combines aspects of the traditional trade theory, mainly in its factor conditions and demand conditions determinants, and aspects of the management field in its other two determinants. The logic behind the framework is robust enough for

being used to identify the sources of competitive advantage in the beef industry in New Zealand and Uruguay. Therefore, Porter's Diamond framework was selected as the appropriate framework to accomplish the objectives of this research. Following the framework contributes not only to the solution of the research problem, but also to an organised presentation of the information.

In this research the Porter's Diamond Framework was used as an approach to structuring and analysing the relevant factors that contribute to competitive advantage in any industry. In light of criticisms made of the framework, some modifications will be introduced, mainly in regards to the inclusion of corners of the Diamond located in other countries as suggested in the double or multiple linked diamond frameworks. The next chapter presents the role of Porter's theory in the study as well as the research design and method.

CHAPTER 3

Research Design

3.1 - Introduction

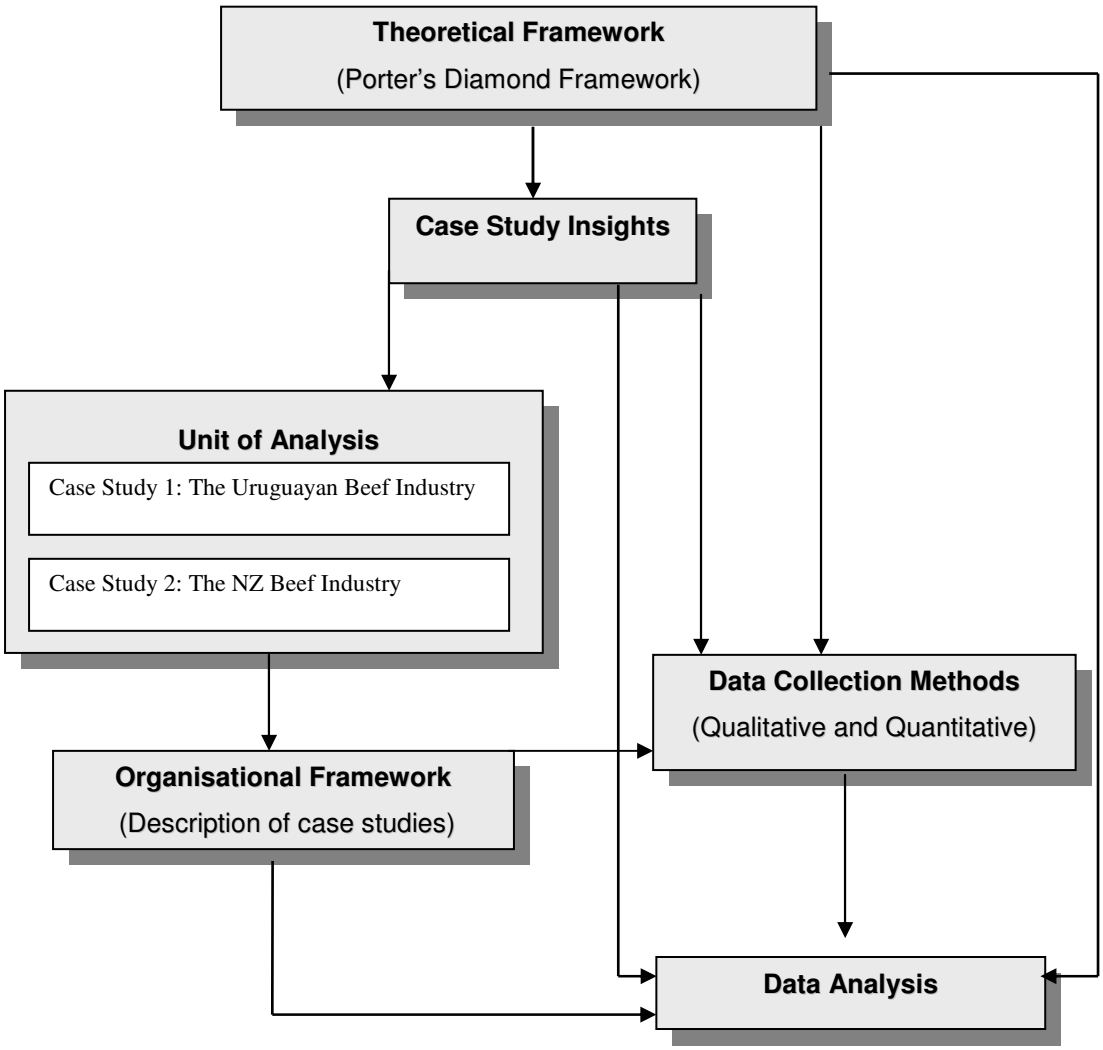
The review of the literature carried out in Chapter 2 provided the support for choosing Porter's Diamond Framework as the most appropriate theoretical base on which to approach the research problem being addressed in this study. Chapter 3 aims to present the research design and methods for solving the research problem. The structure of this chapter follows the research design sequence, as described in Figure 4.

The research design describes how the theoretical framework is going to be used to meet the objectives of this study. As described in the framework, there are several factors that are likely to affect the competitive advantage of the industries within a country. In this chapter the information likely to affect the sources of competitive advantage for the Uruguayan and New Zealand beef industries, in particular, are identified and described.

Following this, the case study approach is presented as an appropriate research strategy that could provide useful insights for carrying out the research, therefore, a brief review of case study literature is presented and some important aspects were identified as relevant. These were the selection of a unit of analysis, data collection methods and data analysis. This chapter focuses on describing the literature related to these areas.

In the next section the organisational framework is described. The objective of selecting an organisational framework is to decide which information is to be collected and to clearly identify the participants of the case studies. The theoretical and organisational frameworks define the information gathered for this study. The chapter ends with a description of how the data is going to be collected and analysed.

Figure 4: Research Design Sequence



3.2 - Theoretical Framework

The theoretical framework selected to follow in this research was the Diamond Framework for assessing national competitive advantages proposed by Porter in 1990. This framework and the reasons for using this framework were described in Chapter 2. According to Porter (1990), there are several factors within a country that allow or prevent its industries from creating and sustaining competitive advantage. This framework provides a systematic method to analyse the competitive advantage that a country provides to the industries that operate within its boundaries. Therefore, this framework is very useful in facilitating an extensive study of these sources of competitive advantage in the Uruguayan and New Zealand beef industries without leaving things out. For this framework to be operational, a range of information needs to be gathered from

the four points of the diamond and the external factors. The information required is shown in Table 1.

Table 1: Information Required to Make the Theoretical Framework Operational

Porter' Diamond Determinants	Information Gathered in Both Countries
Factor Condition (Characteristics in the country that are relevant for the beef industry)	• Size, location and boundaries of the Country • Climate • Topography • Soils and natural grasslands • Cost, quality and availability of relevant resources (human resource, knowledge resource, capital resources) • Infrastructure relevant on the farms, the transportation of cattle and the allocation of beef on the domestic or international market (roads, ports, airports)
Demand Condition	• Volume consumed domestically • Market channels (supermarkets, butchers shops, others) • Type of product consumed • Domestic Prices • Volume and type of product exported • Prices received • Requirements of the international markets
Supporting and Related Industries	• Suppliers of farm inputs and technology • Suppliers of inputs and technology to the processing industry • Related industries at the farm level • Related industries at the processing level
Strategy, Structure and Rivalry	• General description of the farming sector • Strategies in the primary firms • Productive performance • Cost of Production • Structure of the processing plants • Slaughter capacity • Level of competition among processing companies • Cattle transaction strategies • Marketing strategies
External Factors Government Chance	• Regulations regarding beef trade • Regulations in the domestic market • Support in R&D • Support in education • Participation in the financial market • Currency policies in relevant countries • World beef demand and supply • Diseases outbreaks (BSE, FMD)

3.3 - Case Study Approach

Effectively, two case studies were conducted. In this section insights from the case study approach are discussed. According to Yin (1994), a case study aims to explore certain

phenomena and to understand them within a particular context. According to Miles & Huberman (1994), a case can be defined as a "phenomenon of some sort occurring in a bounded context". The unit of analysis is the case to which the variables or phenomenon under study and the research problem refers and about which data is collected and analysed. A case study implies a single unit of analysis (Hussey and Hussey, 1997). This study used an explanatory case study as the research strategy and the unit of analysis is the beef industry[10] in both countries. Explanatory case studies are appropriate where existing theory is used to understand and explain what is happening (Wood, 2000).

An important characteristic of the case study as a research strategy is that several sources of evidence can be used. In case studies multiple methods for collecting data, which may be both qualitative and quantitative, are commonly used. According to Yin (1994) there are six sources of evidence that are the most commonly used in case studies. These sources of evidence are documentation, archival records, interviews, direct observations, participant-observations and physical artefacts.

In regard with interviews, which is one of the most important sources of case study information, there are three main types of interviews and they vary in the extent to which the interview questions are determined and standardised before the interview occurs, and in the relationship between interviewee and interviewer (Yin, 1994). The first type of interview is "*open-ended*" interview in which the interviewer asks the respondent about the facts of a matter as well as their opinions about events. In this case, the respondent has a role of key informant. A second type of interview is "*focussed interview*" in which a respondent is interviewed for a short period of time. In this case the questions may still remain open-ended and assume a conversational manner, but the interviewer is more likely to be following a certain set of questions derived from the case study protocol. Finally, the third type of interview entails more structured questions, similar to what is in a formal survey. In case study research, the most common type of interviews used are open-ended interviews.

Overall, interviews are an essential source of case study evidence. The problem being analysed can be reported and interpreted through the eyes of specific interviewees, and

[10] Industry, as was defined in Chapter 1.

well-informed respondents can provide important insights into a situation. They can also provide some shortcuts about the prior history of the situation by helping to identify other relevant sources of evidence. However, information obtained from interviews is subject to bias, problems of poor recall and poor or inaccurate articulation. Therefore, it is essential to combine the information obtained from interviews with other sources of information. In fact, in case studies the data collection process is, generally, characterised by the use of several sources of evidence. This method is different from other research strategies, such as experiments or surveys, which use a single source of information. Case studies are relevant for research problems where several sources of data can be mixed for a better understanding of the problem being studied (Yin, 1994). Therefore, data triangulation, where information from several sources are compared, is a common and useful tool in case studies.

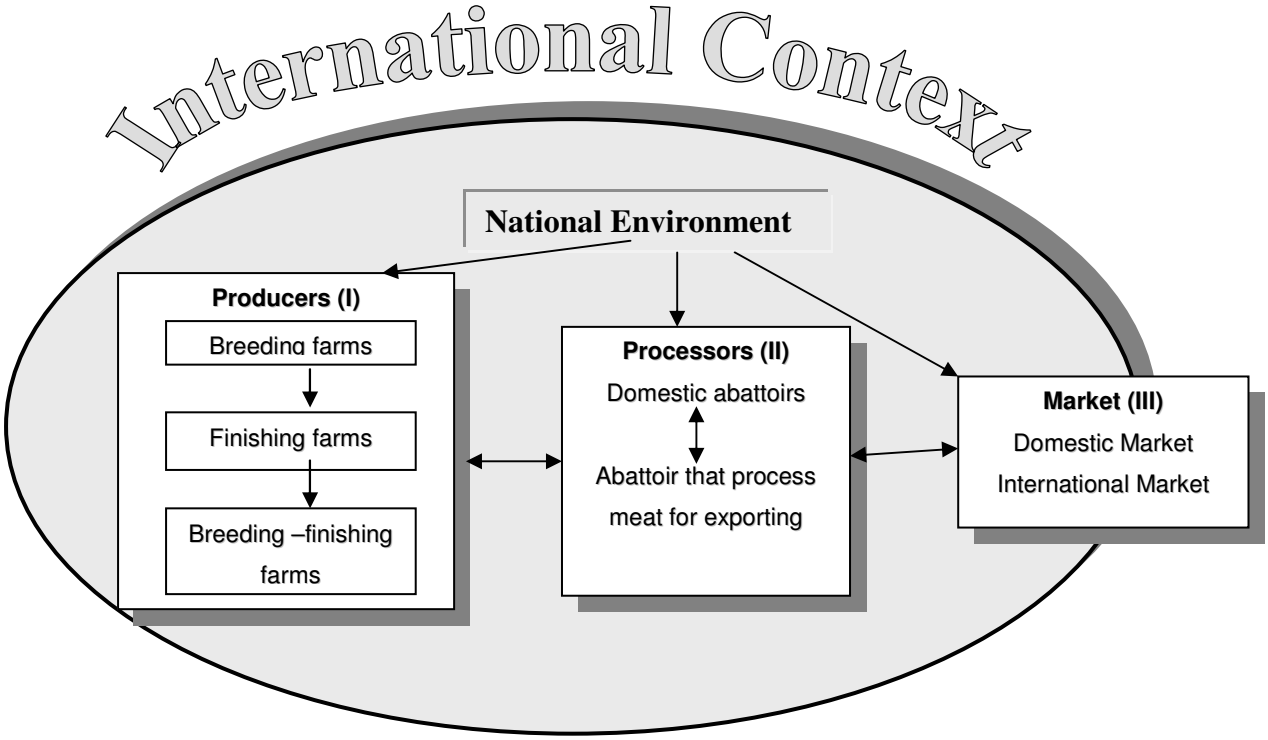
There are certain criteria that can be followed for judging the quality of any research design. Four tests have been commonly used to establish the quality of any empirical social research, since case studies are one form of such empirical research, these four tests are also relevant for testing the quality of case studies. These four tests are as follows; a) *construct validity*, establishing correct operational measures for the concepts being studied; b) *internal validity*, establishing a causal relationship, whereby certain conditions are shown to lead to other conditions, as distinguished from spurious relationships (only for explanatory or causal studies); c) *external validity*, establishing the domain to which a study's finding can be generalised; d) *reliability*, demonstrating that the operations of the study, such as the data collection procedures, can be repeated, with the same results (Yin, 1994).

Important information can be obtained from the case study literature such as the suitability of using several sources of data for solving the research problem, information about type of interviews and the definition of a unit of analysis. This research uses multiple methods of collecting data and from multiple sources. In addition, the information from the different sources will be triangulated as is proposed in the case study literature.

3.4 - Organisational Framework

To carry out this research much information was required to be collected from both countries. In this section an organisational framework is presented. The scope of this research is the beef industry in Uruguay and New Zealand. The organisational framework presents which aspects of the beef industry were considered as the centre of analysis. And helped to organise the data collection and data analysis.

Figure 5: Organisational Framework



This study will focus on analysing how the characteristics of the country affect the sources of competitive advantage that the beef industries of Uruguay and New Zealand have in the international context. The main components that were studied were- the producers (including the different groups and their relationships (strategies and performance) - the processing sector - the domestic market (including volume marketed, type of product, its mains players and relationship with the other steps of the chain) and - the international market (to identify the role of the beef industry of Uruguay and New Zealand in the international context).

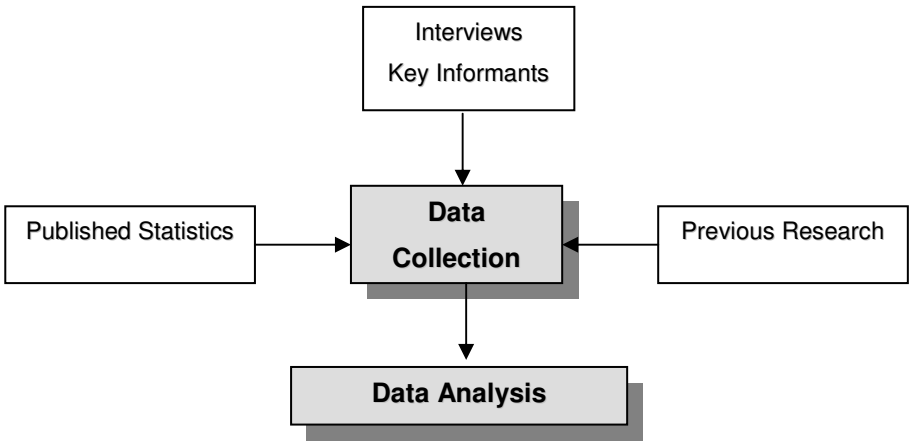
3.5 - Methods of Data Collection

The theoretical and organisational frameworks provided the basis on which to select relevant information for the objectives of this study. This section introduces how data were collected and analysed.

The data collected in this research includes both quantitative and qualitative data. The data collection process was a continuous task throughout the research, from the preparation of the research proposal until the final stages of data analysis. The guide to the type of data collected was provided by the theoretical framework used in this research. Since this study required the analysis of two industries in two different countries, if the information collected was not carefully selected, the amount of unnecessary information would make it difficult to draw conclusions.

Two main sources of data were used in both countries. They were secondary data, including previous research, and private and public statistics, and interviews with key informants and participants of the industry. The data collection process included fieldwork in Uruguay (in November- December 2002) and in New Zealand (in January / February 2003) to interview key informants and participants in the industry.

Figure 6: Data Collection Process



Appendices I and II present the main sources of statistical information gathered in Uruguay and New Zealand. Most of this information is published weekly, monthly or annually. In most of the cases several periods were considered, therefore, several volumes from each of the detailed sources were consulted during the study. The criterion for

selecting the statistics sources was the reliability of its information. In both countries governmental statistics or from well-known sources were used. It was also considered the period of time that the sources have being published, selecting the ones that have been published for longer time.

Interviews were an important component of this research and they complement the information obtained from the secondary sources. Open-ended interview were used, with an interview guide used as a checklist. This type of interview was appropriate for this research because, although the general questions were used as a guide for interviewing the different informants, the previous information available affected the structure of each interview. Therefore, the relevant information that was available was checked before the interview so the questions were about the information that was not available and about their opinions about this information. The data obtained from the interviews were recorded and then transcribed for analysis. During the interview some notes about the key issues were written and were then used during the transcription of the tapes. Appendices III and IV present detailed information about the interviewee, the information gathered from the interview and day and time of the interview in both countries. The criterion for selecting the interviewees were the information that was required after analysing the secondary sources available in each country. The key informants were selected considering their areas of expertise and the viability of interviewing them. Apart from the key informants in Uruguay six processing companies were visited and several managers from each plants were interviewed. In New Zealand two people from the processing companies were interviewed.

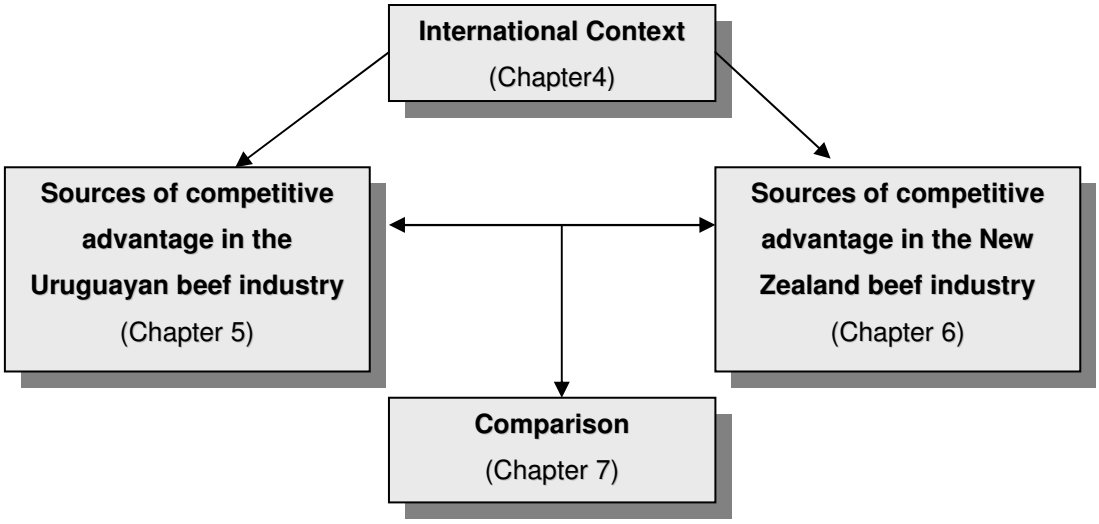
3.6 - Data Analysis

The analysis of the data was one of the most time consuming tasks of this research. As a consequence of the type of research, data analysis and data collection were simultaneous processes, during the development of the research. On some occasions the analysis of the data already collected led to more data being required to provide a full understanding of the facts.

The analysis of the data was carried out in two stages. First, three main bodies of information were obtained and analysed. These were the international context for the beef

industry (presented in Chapter 4), the analysis of the sources of competitive advantage in the Uruguayan beef industry (Chapter 5) and in the New Zealand beef industry (Chapter 6) following Porter's Diamond Framework. Then, a comparison between the two industries was carried out on the basis of this first stage analysis (Chapter 7). Figure 7 shows the results and data analysis procedures.

Figure 7: Data Analysis Procedure



3.7 - Chapter Summary

This research consists of two explanatory case studies, "the Uruguayan beef industry" and "the New Zealand beef industry", using Porter's Diamond Framework as the theoretical background and trying to find the sources of competitive advantage in both industries. The data were gathered from secondary sources and interviews and the data were both qualitative and quantitative. The next chapter, the first of the three result chapters, presents the analysis of the beef industry in the international context.

Chapter 4

International Context of the Beef Industry

4.1 - Introduction

As was presented in the introduction of the research problem, both Uruguay and New Zealand need to focus on the international market for further expansion of their beef industries, since their small domestic markets are not likely to absorb an increase in beef production in the future. Therefore, it is important to identify the forces affecting this international environment. Chapter 4, the first of the three results chapters, aims to analyse the international context of the Uruguayan and New Zealand beef industries. This chapter starts with a description of the different types of beef markets and the factors governing them. Next, the main world players in the beef market, including the main producers, exporters and importers are presented. Finally, the main changes in the world beef environment and how the beef industry has adapted to them, are presented.

4.2 - Type of Beef Markets

In the international beef market, there are several characteristics that differentiate countries in the production and consumption of beef products. The first of these differences includes feeding methods. There are countries that predominantly grass-feed their animals, such as Australia, New Zealand and South American countries, and countries that grain feed their cattle, mainly with corn, such as the US and Canada (Australia also produces grain-feed beef). Grain-fed cattle tend to have more marbling and internal fat which makes the meat tender, while grass-fed cattle tend to have less marbling resulting in less tender, but leaner beef.

The characteristics of the product each country produces also affects the products each country is likely to import. The US, for example, imports grass-fed beef, mainly to use in hamburger production, because of its low fat content, to mix with their fattier beef (Katz & Boland, 2000). Because of the differences in product based on feeding methods, there is significant competition between Australia, the US and Canada in the grain-feed beef

market and between Australia, New Zealand and South America countries, in the lean beef market (Ilundain, *et.al.,* 2002).

Second, beef markets are different in relation to the type of product commercialised. Although beef is often considered as a homogeneous product, it is not. Beef can be exported frozen or chilled, bone in or boneless, in special cuts or grinded, cooked or salted. All these products have different prices, product specifications and quality requirements. Therefore, they require different types of cattle and different processing and packaging techniques. Exporting countries need to fulfil the requirements of each of these specific markets in order to export (Ilundain, *et.al.,* 2002).

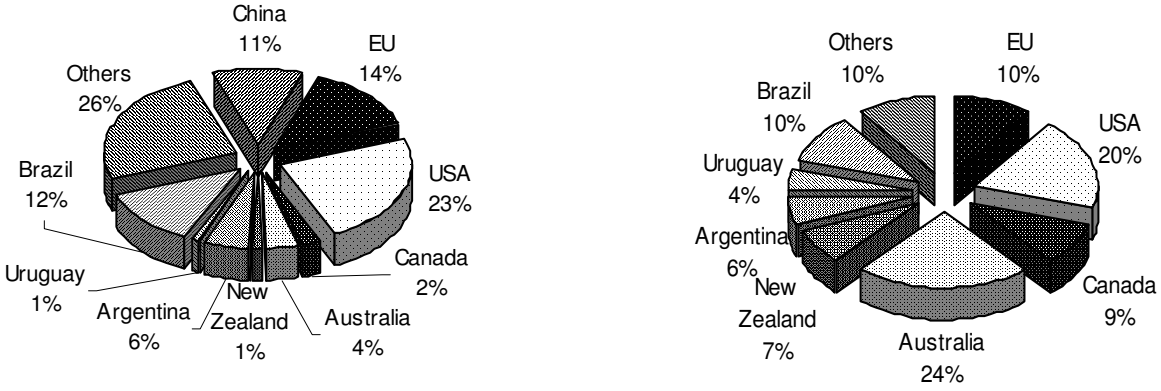
Finally, the sanitary status of each country can determine which market they can operate in. FMD[11] status is one of the most important factors dividing the beef market. The Epizotias International Office (OIE) defines two areas in relation to FMD. The first is countries or areas free of FMD which have not done any vaccination in at least one year (the US, Australia, New Zealand, Central America, Japan, Korea, and other Asian Southeast countries). Countries that are unable to garantee freedom from FMD, fall into two groups. These are countries that have the disease and countries free of FMD but with vaccination such as Uruguay now. Countries free of FMD are allowed to export to more lucrative markets, such as the US, Canada, Japan, and South Korea. Countries that vaccinate for FMD are restricted to one lucrative market for chilled and frozen beef, the EU, where beef access is heavily controlled by quotas and tariffs. For free of FMD markets, countries with the disease can export only cooked, canned or salted beef products. The rest of their beef needs to be allocated to FMD markets which, generally, have lower prices than the FMD free markets (Ilundain, *et.al.,* 2002; Lema, 2000).

[11] Foot and Mouth Disease (FMD) is one of the most contagious viruses affecting cloven-hoof animals such as cattle, sheep, goats, llamas, camels, pigs and deer. The disease does not cause the death of the animal but seriously retards production. The virus does not affect humans or the quality of the meat from animals reared in endemic areas. The virus is very sensitive to the pH of the environment. Most serotypes are inactivated at pH 6.5. All types are inactivated below pH 4 and above pH 11. After slaughter the pH decrease as the result of the breakdown of glycogen in the muscle tissue from lactic acid. This process does not occur in connective tissue such as lymph nodes or bones marrow. Bone marrow can be a ready source of infection and product has to be boned out to reduce the risk. The virus is inactivated above 50 ^{o}C but is stable at low temperatures. That is the reason why USA import heat treated beef from FMD endemic areas.

4.3 - Beef International Trade

International beef trade has increased significantly in recent times due to the removal of trade barriers and eradication of diseases. Approximately 11% of the total beef production is exported internationally (excluding intra-EU trade). World beef production is highly concentrated with three countries plus the EU countries producing 60% of the world's beef. The US, China, Brazil, and the EU countries are the most important producers. The main beef exporting countries are Australia, the US, Brazil, Canada, New Zealand, Argentina, Uruguay and the EU countries. Australia remains the main beef exporter in the world exporting mainly grass-fed beef but, recently, it has increased its exports of grain-fed finished beef to Japan and Korea. There has also been an increase in consumption of grain-fed beef in the Australian domestic market. In 2000, 15% of Australian exports were grain-fed beef. Australia has also moved from frozen to chilled beef exports as a consequence of an improvement in processing and storage technology. The US and Japan are the most important importing countries for Australian beef (RaboBank, 2001).

Figure 8: Beef Production and Beef Exports by Country/ Region



Source: RaboBank (2001) based on USDA

The second most important beef exporter is the US, although, it is still a net importer by volume. The US imports mainly manufacturing beef for the food service industry (hamburgers), whereas its exports are mainly value added products. The US imports

grass-fed beef from Australia, New Zealand and South American countries and exports grain-fed beef mainly to Asian countries (RaboBank, 2001).

South America's main beef producers are Brazil, Argentina and Uruguay. These three countries account for the 20% of the world beef exports being Brazil the third main exporting country after Australia and the US. After the outbreak of FMD in South America the export of frozen and chilled beef from Uruguay Argentina and Brazil decreased considerably and only cooked and canned beef was exported from these countries. Argentina and Uruguay then started to vaccinate their livestock against FMD[12], and Uruguay has recovered most of its main markets (Canada and the US). There is significant trade within MERCOSUR[13] countries depending on the currency competitiveness. Brazil and Argentina have always taken an important proportion of Uruguayan exports. This trade has always been mainly from Uruguay to Brazil and secondly to Argentina (Ilundain, *et al.,* 2002).

European Union exports are closely related to the level of intervention stock. BSE in 1996 and the FMD crisis have decreased considerably the demand for EU beef in the world. Most of the beef from the EU has gone to the Russian aid programme where it receive a low price (Ilundain, *et al.,* 2002).

As can be appreciated in Table 6, apart from New Zealand, Australia, Uruguay and Canada, most beef produced in other countries is sold internally. As a consequence, for most countries, the international market is not the most important factor affecting their industries. In contrast, for Uruguay and New Zealand as well as for Australia and Canada, the international market plays a significant role in the performance of their indusries. Therefore, all the regulations and trade barriers by other producers countries (mainly the US and the EU countries) severely affect these industries (Ilundain, *et al.,* 2002; MIA, 2002).

[12] After being free of FMD without vaccination since 1996 in the case of Uruguay.

[13] Common market of the southern cone

Table 2: Percentage of Beef Exported / Beef Production

Region/Country	% Export / Production
New Zealand	77
Australia	66
Uruguay	56
Canada	44
Argentina	12
Brazil	10
USA	9
EU[14]	8
Others	3
World	11

Source: MAF, (2001)

In relation to beef demand, the US, Brazil and China are the largest consumers of beef in the world. In 2000 these countries accounted for 49% of the share of global beef consumption (the US 26%, Brazil 12% and China 11%) (USDA, 2001). The long-term trend in beef consumption varies in relation to the characteristics of the market. In mature markets, such as Argentina, New Zealand, EU and the US, there has been a long term decline in beef consumption per capita, since beef has lost price competitiveness, consistency, convenience and image against other meat options, such as poultry and pork (RaboBank, 2001). In the EU, the BSE crisis and the FMD outbreak have had also important effect in the beef consumption, and a long term declining trend is expected (Ilundain, *et al.,* 2002;).

In contrast, in growing markets, beef consumption is increasing, and there are different patterns in different countries. Asian markets are good examples of growing markets. From 1995 to 2000 Asian total growth in beef consumption was 24%, being relatively high in China (30%), Korea (32%), Philippines (55%) and Taiwan (39%). The main reasons for higher beef demand in the Asian countries are an increased disposable income, reduction in trade barriers and cultural exposure to western diets (RaboBank, 2001). Despite low priced cuts increasing in popularity in Japan, the most important products that Japan imports are quality grain-fed beef from Australia and the US. Southeast Asian countries will continue to rely on imported beef because it is unlikely that they can develop livestock production because of land constraints (Ilundain, *et al.,* 2002).

[14] Excludes Intra-EU trade

Supply and demand are not the only forces affecting the beef market. There are several barriers imposed by different sanitary status, level of protectionism of importer countries and quota systems that regulate the market. The Uruguayan Round of GATT has been an important development for the marketing of agricultural products and it has also been an advance for beef trade. The establishment of the tariff quotas allowed exporting countries to enter the main markets in North America and the EU. Despite this progress, international beef markets are far from being free markets, since the tariffs-off quota are high and often make any imported product unable to compete with the domestic product. Also, the market is distorted by an array of subsidies applied by beef producers and exporting countries. Uruguay and New Zealand meat have quotas in the US and in the EU markets (INAC, 2002; Meat NZ, 2002). Table 8 summarises the meat quotas for Uruguay and New Zealand in the EU and the US markets.

Table 3: Uruguayan and New Zealand Beef Quotas

Market	**Uruguay**[15]	**New Zealand** [16]
North America It has a total of 696,621 tonnes shipped weight among all the suppliers' countries (Brazil, Argentina, Uruguay New Zealand and Australia) The product is mainly boneless frozen beef, and manufactured boneless frozen beef	Uruguay has a quota of 20,000 tonnes shipped weight in the US. Under this quota Uruguayan beef pays 11US$/tonne and an excess over this quota pays 26.4%.	It has 300,000 tonnes shipped weight of manufactured beef.
European Union Europe has 58,100 tonnes shipped weight of high quality beef to be fill by the supplier countries	Uruguay has 6,300 tonnes shipped weight of Hilton quota. The tariff under the Hilton[17] quota is 20% and beef exported over that volume has a tariff of 12.5 % plus 1,760 to 3,041 Euro/tonne depending on the type of product.	New Zealand has 300 tonnes (net product weight) of high quality beef (within the tariff rate quota (TRQ) referred to as in-quota. An out-of quota tariff rate of 12.8 % plus 1,414-3,041 Euro/ tonne applies to products imported outside this quota, depending on the type of products.

Source: Meat NZ, 2002; INAC, 2002

[15] Uruguay has also a sheep meat quota in the EU of 5,800 tonnes carcass weight (3,480 tonnes shipped weight) free of any tariff. Over this quota sheep meat pays 12.8% plus 2,345 to 3,118 Euro/tonne (depending on the value of the cuts). For sheep meat Uruguay do not have a limitation in the US market. Uruguayan lamb meat pays 7US$/tonne/ and adult sheep meat pays 28US$/tonne to enter the market.

[16] New Zealand has 225,500 tonnes of sheep meat in the EU.

[17] Uruguayan specifications for supplying the Hilton beef quota are: special or good-quality beef cuts obtained from exclusively pastures-grazed animals presenting a slaughter live weight not exceeding 460 kg, refereed to as "special boxed beef. These cuts may bear the letters sc (special cuts).

During an interview with Neil Taylor (CEO of Meat New Zealand) regarding the World Trade Organisation (WTO) resolutions and the beef trade, he was optimistic about having lower levels of subsidies and non-trade barriers in the future in markets such as Europe. However, he was aware that it would not be easy for European countries to contemplate all the issues implicated in their trade policy. On one side, the consumer has the right to buy a product from the most efficient countries, which are able to produce it at a lower cost. On the other hand, governments need to consider the requirements of European farmers, to keep people employed in farming in these countries (Neil Taylor, personal communication, 21 February, 2003).

Neil Taylor argued that the WTO allows the countries, which are in a disadvantageous position, to complain. Therefore, the WTO provides rules. Without them, it would be impossible for small countries such as New Zealand to survive and it would be "the law of the jungle". He suggested that it is a step in the right direction despite the fact that it is extremely slow. New Zealand, for example, won an argument against the US regarding some barriers for lamb entering to the US. Overall he was optimistic about the WTO role in the liberalisation of the agricultural markets, but he emphasised that it is expected to be a slow process (Neil Taylor, personal communication, 21 February 2003).

4.4 - Changes in Beef Demand

In recent decades, beef has lost market share in relation to pork and poultry in markets such as the US. Although meat consumption per capita has grown, beef consumption per capita has decreased. The consumption of beef substitute products, such as poultry, has increased steadily since 1940. This increase has been more prominent since 1975 when poultry meat consumption increased 91% from 1975 to 1995 (CAST[18], 1997). In 1975 beef accounted for 48% of consumption of meat products, while in 1997 that share was 32% (Lamb & Beshear, 1998). The behaviour has been, and is expected to be, different depending on the type of market, however, in all markets the growth rate of poultry consumption is higher than the other meats.

[18] Council of Agricultural Science and Technology

Table 4: Meat Consumption (beef, poultry and pork) by Region

Region	Annual growth of meat consumption (% / year)		Per capita consumption (kg)		
	1982 -1993	1993 – 2020*	1983	1993	2020*
Developed World					
Beef	0.1	0.3	27	25	25
Pork	0.9	0.2	29	29	29
Poultry	3.3	0.9	16	20	24
Total Meat	1.2	0.5	74	78	81
Developing world					
beef	3.1	2.8	5	5	7
pork	6.1	3.0	6	9	13
poultry	7.4	3.1	3	5	8
Total Meat	5.3	2.9	15	21	31

Source: Adapted from CAST, 1999 (*Estimated by Cast)

According to CAST (1999), in the future the increase of meat consumption is expected to be higher in the developing world. Considering the types of meat, poultry have been increasing at a higher rate than the other meats in both regions, developing and developed countries. CAST, (1999) expect poultry to increase the consumption with a higher rate than other meats from 1993 to 2020.

Several factors have been presented trying to explain the loss of market share of beef. Lamb & Beshear (1998) argued that the higher price of beef in comparison to poultry and pork has been one of the reasons. However, the authors stated that more likely explanations are based on non-price factors such as, quality, consistency, adjustments to changes in consumer's lifestyles, consumer preferences and health concerns. Price, quality and consistency of beef have been left behind pork and poultry, which has meant a decrease in beef markets in comparison to these competitive products.

Lamb & Beshear (1998) have stated that the beef industry has not been as responsive, in comparison to pork and poultry, satisfying changing consumer demand. Consumers want high quality and consistency in the product they receive and beef has not been able to offer that. The authors argued that the low level of co-ordination in the beef chain has been considered as a reason for this problem because it does not allow a good control of the product along the chain by focussing on what the consumer wants.

Changes in consumer's lifestyles have also affected beef demand. In the late 1990s an average family in the US spent 15 minutes in meal preparation, while in 1950 they used

to spend 60 minutes (Kinsey, 2000). Hence, consumers require products that are ready to use. The poultry and pork industries have been good at developing new products to satisfy these requirements. For example, they have developed products that can be cooked without preparation and introduced seasoned and marinated meat, which are easier to prepare (Lamb & Beshear, 1998).

Along with the change in consumer's lifestyles, health concerns have changed consumers diets. It has been an important force affecting beef demand because of the concern about the levels of fat and cholesterol in beef. The pork and poultry industry have moved in that direction and worked to try to reduce the level of fat of their meats (Lamb & Beshear, 1998). Beef is considered to have high levels of saturated fat and cholesterol and little evidence has been put forward to demonstrate the opposite.

E.Coli 0157:H7 and *BSE* (bovine spongiform encephalopathy) have severely affected beef demand through increased consumer concerns about beef's safety. Recently FMD has affected the industry with the outbreak in Europe and in the South American countries (Kay, 2001). Food safety is an important issue worldwide, and several countries are tightening their legislation regarding labelling and traceability (Hobbs, 1998; Boehlje, 1998; O' Keefe, 1997).

Finally, environmental and welfare issues are becoming more and more important factors affecting consumers' demands, particularly among western consumers. As a result countries with natural resources appropriate for developing a natural beef production system could exploit this competitive advantage offering an environmental and animal friendly product (Taylor, 1998).

There are also other factors not related to consumers that have affected the internal beef traded environment, such as technology. For example, genetic engineering used in food production, packaging techniques used in distribution systems and information technology (e–commerce) used in marketing (Boehlje & Sonka, 1998). Advances in shipping and processing technologies have largely affected beef trade. For example vacuum packaging using inert gases, refrigerated containers and containerised shipping have resulted in the ability to ship beef longer distances and increase the shelf life without rising health concerns (Katz & Boland, 2000).

4.5 - Response to a Changing Environment

It has been argued that the success of the poultry and pork industries is a consequence of their shift towards a high level of vertical co-ordination. This has helped these industries to become consumer-driven. It has also helped to reduce costs by increasing efficiency, hence keeping prices low (Lamb & Beshear, 1998). Barry (1995) argues that there is a trend towards vertical co-ordination. There are important examples related to vertical-co-ordination in the beef industry in the US, the UK and Australia. In the US, the number of cattle traded through contracts or strategic alliances jumped from 25% in 1997 to about 35% in 1999 (Hayenga *et al*., 2000). In Australia, 27% of the beef cattle is marketed in a co-ordinated relationship (Toma, 2000). In the meat industry in the UK many partnerships between producers, abattoirs and supermarkets in the 1990s have emerged. In recent years these partnerships have also included breeders and feed manufacturers. In 1998 these partnerships represented 20% of the UK's beef and lamb production (Fearne, 1988).

Another important change in the beef industry is the movement from a commodity to a branded product. This is happening mainly in the US, Australia, and Europe. Branding at the consumer-level is occurring in three ways (for both fresh and further processed beef). First, retailers are creating an in-house identity for their meat (e.g. Ralph's California Beef in Southern California). Second, individual companies have introduced branded beef products using well-established or new brand names (e.g. IBP's *Thomas E. Wilson* and Excel corporation's *Butchers and Cooks* and *Sterling Silver*). Third beef organisations have introduced their own programmes based on breed or region (e.g. *Certified Angus Beef* and *Nebraska Corn-Fed Beef*) (Lamb & Beshear, 1998).

Finally, there are some opportunities by offering a natural product. Natural[19] and organic beef has been considered a differentiated product with higher prices and is being researched as an alternative. Changes in consumer demand have shown an increase in demand for natural and organic beef, which it has been identified as a niche market to be satisfied and an opportunity for the industry (Boland, *et al*., 1999).

[19] USDA introduced the term "natural" in 1960. Natural beef means that is produced without any artificial ingredients or added products and that it is minimally processed.

4.6 - Chapter Summary

The objective of this chapter was to analyse the main factors affecting the international context for the beef industry by identifying the different markets, the producers exporting and importing countries as well as the factors affecting the international beef demand. Although the beef industry appears to be a mature industry, economic forces, changes in consumer preferences, technological development and changes in the sanitary status of several markets have increased the volatility of the industry environment. This increases its risk but also creates opportunities for the different participants of the industry.

There are three main characteristics of the beef industry which are particularly important. First, the final product is an input for the food industry. Consequently, consumer preferences, food safety concerns and health problems associated with beef consumption affect the demand for beef, which has been decreasing in the long term in mature markets, such as the US, but increasing in growing markets, such as the Asian countries. Secondly, there are many sanitary barriers to prevent the spread of certain diseases such as FMD and BSE, which prevent the market from being a free-trade market. Finally, there are quota and tariff systems in place in the main markets (such as the US and EU) that control the conditions, under which, beef could be exported to these countries.

CHAPTER 5

Case Study I: The Uruguayan Beef Industry

5.1 - Introduction

Chapter 4 introduced the international context for the beef industry and identified the main forces affecting the industry, which are relevant for Uruguay and New Zealand. This chapter presents and discusses the results from Case Study 1 *"The Beef Industry in Uruguay"*. This chapter has two main sections. Section one presents an overview of the development of the industry. Section two analyses the sources of competitive advantage of the industry following Porter's Diamond Framework.

5.2 - Development of the Industry

The first two ships with cattle were brought to Uruguay in 1611 and 1617 by the Spanish settlers. Uruguay's good natural conditions for pasture production, and low population constituted an ideal environment for the rapid spread of the cattle *(Cimarron or Criollo*[20]*)* all over the country[21]. At the end of the 19th century, freezing technology started to be available world-wide and was introduced in Uruguay at the beginning of the 20th century[22] producing important changes in the beef industry. In 1904, 80% of the beef exported was converted into jerky beef. Conversely, by 1914, 80% of the beef exported, was frozen and, in 1930, the jerky beef trade disappeared completely. There were also important changes in the destination of the beef produced, for example, in 1908 only 18.7% of the beef produced was exported, while in 1930, 46% of the beef produced was allocated to the international markets (Alonso, *et al.,* 1983).

[20] Cattle that inhabited the country at that time, they were quite different from the modern cattle because they were smaller and they produced low quality meat.

[21] The "Vaquerias" were the first organised structures for cattle exploitation and were constituted by a group of people with the common purpose of hunting the cattle that were grazing freely. There was no ownership, neither of the land nor the cattle. The most valuable products for commercialising, at that time, were the hide and the tallow. The *"Vaquerias"* predominated for nearly two centuries. At the end of the 18th century an increased demand for jerky beef *("tasajo")* appeared, when it was used to fed African slaves working in cropping farms, mainly in Brazil, Cuba and the US. To meet this demand several meat-salting houses (*"saladeros")* were created in Uruguay. During this period livestock production became more profitable than in the previous era, since beef could be marketed as well as hide and tallow (Vega, 2001; Alonso, *et al.,* 1983).

[22] The first slaughterhouse was established in 1904 in Uruguay.

The livestock-farming sector also underwent significant transformation at the end of the 19th century and the beginning of the 20th century. First, a land ownership system was established and land fencing was introduced to divide the different farms and the paddocks inside the farms. Second, sheep were brought from Europe increasing the pasture utilisation rate (due to the complementary grazing habits of cattle and sheep) and reducing the risk faced by livestock farmers relying on a single product. Third, British breeding cattle were introduced to improve the *"Criollo or Cimarron*" cattle already available in the country, which produced an important improvement in livestock productivity and beef quality. These changes have been the basis for the modern livestock farms *(Estancias)* that exist in Uruguay nowadays (Alonso, *et al.,* 1983).

The processing infrastructure was developed at the beginning of the 20th century, with foreign investment, mainly from England and North America, which rapidly developed the production process and the export markets. Three companies, Armour, Aswift (North American) and Anglo (British), installed slaughtering and packing facilities between 1911 and 1924 (Alonso, *et al.,* 1983).

In 1928, as a consequences of some conflicts generated between the foreign companies and the farmers, the government founded the first state abattoir *"Frigorifico Nacional*" (National Slaughterhouse). Since that time government plants had the monopoly for supplying the markets of Canelones and Montevideo[23]. The rest of the country was supplied by small plants, licensed by the regional governments of the rest of the 17 political divisions. The foreign plants supplied the international market and in exceptional circumstances, when it was required, the domestic market.

From 1928 until the late 1970s, the Uruguayan beef industry was highly regulated. There were restricted licensing of plants since the government controlled the opening of new plants according to the requirements of the country and trying not to affect the performance of the other plants. In addition, the movement of beef from one region to another was forbidden and the livestock market was highly regulated. Each of the governmental divisions *(Departamentos)* controlled the licensing of plants under their

[23] Uruguay is organised in 19 political divisions "*Departamentos*" with a regional government. Montevideo is the capital city and accommodates more than 45% of the total population of the country. *Canelones* is located at north of *Monetevideo* and it is the second most populated "*Departamento"* of the country.

jurisdictions. Usually, each regional office had their own requirements for plants to operate (INAC, 1985).

However, when the national slaughterhouse was closed in August 1978, several changes occurred in the industry. First, the beef and livestock markets were liberalised. Second, the domestic market could be supplied by any licensed processing plants situated in any part of the country. Third, the licensing and control of plants became the responsibility of the Ministry of Livestock Agriculture and Fisheries (MGAP). Finally, there was free installation of new plants (either for domestic or international markets) if they passed the required regulations and inspections (INAC, 1985).

The deregulation of the beef industry in Uruguay had an important impact over the whole beef chain. Livestock farmers were stimulated by high expectations that a free market would improve beef prices, so they increased their beef stock, which reached one of the highest levels of the century at 11.5 million head. The processing companies also started an accelerated process of innovation. The number of small plants was reduced and the infrastructure, sanitary level, and hygiene of the plants improved. Before August 1978, apart from the state plants and the plants that killed for the international market, there were 607 abattoirs[24] licensed by the regional government, which were responsible for carrying out 20% of the national killing (INAC, 1985).

The update of plants occurred mainly around Montevideo where nowadays most of the big plants are located. The sanitary status of the plants increased and standards were more homogeneous among the different plants since they were licensed and controlled by the same institutions. Therefore, competition among plants becomes fairer since all plants were required to operate according to the same conditions (INAC, 1990).

A study developed by Alonso, *et al.*, (1983), aiming to analyse the situation of the industry after the deregulation process, concluded that the processing industry was inefficient despite the national slaughterhouse - and also other old plants that were said to be the reasons for the inefficiencies - were closed. The authors also found that the capital incorporated into the processing sector neither increased market access nor the efficiency

[24] These abattoirs, in general, had very poor sanitary and hygiene conditions and only some of them managed to update and get a licence when the requirements increased.

of the whole chain. In addition, according to INAC (1985) the innovations of the processing plants were completed without an appropriate analysis, which resulted in several bankruptcies and an unnecessary surplus capacity, which increased 23% from 1978 to 1985.

In the mid-1990s, the industry went through another stage of development with important improvements in the productivity of the farming sector and in the processing plants' infrastructure. In addition, new markets were captured, such as NAFTA and Asian Countries[25]. However, the prices received by the Uruguayan beef in the international markets have been lower than other countries producing similar products (e.g. Argentina and New Zealand) (Ilundain, *et al.*, 2002; MAF, 2002). In addition, the financial situation of several processing plants has been very poor and others are struggling to maintain a stable and satisfactory performance. The situation in the primary sector is no different and farms have also only achieved consistently low profitability. Several efforts have been made by the government and the participants of the industry to increase the performance of the beef chain. However, little advances have been obtained until now.

5.2.1 - Summary

The beef industry in Uruguay has a long history, of nearly 400 years. It has always been the most important sector of the economy and its performance has affected the economic development of the country. During this time it has gone through several changes such as the introduction of the freezing technology at the beginning of the 20th century. This change modified the markets where the products were sold and the type the product commercialised. Another important change was the deregulation process that occurred in the late 70s, which changed again the evolution of the industry and laid the ground work for the industry structure that can be appreciated today. Finally, in the mid-1990s the industry started a new era with increments in its productivity and access to new markets given by the free of FMD status obtained in 1996.

The next section presents an analysis of the sources of competitive advantage of the Uruguayan beef industry in order to identify which factors have been limiting and which have contributed positively to the industry.

[25] The entrance to these markets was produced by the free of FMD status gained by Uruguay in 1996.

5.3 - Analysis of the Sources of Competitive Advantage

This section analyses the sources of competitive advantage in the Uruguayan beef industry following Porter's Diamond Framework. The information presented in this chapter was obtained from secondary sources, and key informants that were interviewed during the field study in Uruguay. These sources or information are detailed in apendices I and III respectively. As presented in the literature review, Porter identified four determinants (factor conditions, demand conditions, firm strategy, structure and rivalry, and related and supporting industries) and two external factors (chance and government) affecting the sources of competitive advantage of an industry within a country. This section describes each determinant and discusses their impacts on the sources of competitive advantage for the beef industry. Finally, an analysis of the interactions among the components of the diamond is presented.

5.3.1 - Factor Conditions

According to Porter's Diamond Framework the factor conditions can be organised into five broad components, (a) physical resources, (b) human resources, (c) knowledge resources, (d) capital resources, and (e) infrastructure. This sub-section presents an analysis of these five components focussing on how these factor conditions affect the Uruguayan beef industry's sources of competitive advantage. Because not all the factors are equally important, they will be described accordingly with their relevance for the beef industry.

5.3.1.1 - Physical Resources

As presented in the literature review, physical resources refer to the quality, availability, accessibility and cost of the nation's pool of natural resources (e.g. soils, water, minerals). They also refer to the country's climatic conditions, its location in relation to markets and suppliers, and its size. This section describes the physical resources in Uruguay (including its size, location, climate, soils and pasture production), and analyses their effect on the international competitiveness of the beef industry.

5.3.1.1.1 - General Characteristics of Uruguay

Uruguay is one of the smallest countries in South America with a land area of 17.6 million ha. It is located on the Atlantic seaboard of South America between 53° and 58° west longitude and 30° and 35° south latitude. The coastline is 660 km, and the land boundary is 1,564 km. It is bounded on the west by Argentina along, 579 km, divided by the "Rio Uruguay". On the north and north-east Uruguay is bounded by Brazil, along 985 km, without any geographic features over most of the boundary. On the southeast, Uruguay is bordered by the Atlantic Ocean, and to the south it fronts the *"Rio de La Plata"* (Geographic, 2000; Hudson and Meditz, 1990;The World Gazetteer, 2002).

Figure 9: Map of Uruguay

Uruguay is located within the temperate zone with the four seasons very well defined. Despite having a uniform climate nationwide, north-western Uruguay *(Artigas)* is farther from large bodies of water and, therefore, has warmer summer and drier winters than the rest of the country. The mean annual temperature in the country is 17.6 °C (Artigas 19 °C and Montevideo 16.3 °C). Usually, there are between 20 and 30 frosts with a frost-free period of 240 days. The annual range of mean temperatures is 11 °C in Montevideo and 13 °C in Artigas (Hudson & Meditz, 1990).

Table 5:Temperatures in Celsius (^{o}C)

Location	Mean max (January)	Mean Min (January)	Mean Max (July)	Mean Min (July)
Montevideo	28	17	14	6
Artigas	33	18	18	7

Source: Dirección de Meteorología,1994.

Rainfall is distributed evenly throughout the year. The annual average rainfall is 1,200 millimetres. The annual rainfall increases from south-east *(Montevideo)* to north-west *(Artigas)*. *Montevideo* averages 950 millimetres per annum, and *Artigas* 1,235 millimetres per annum. Evapotranspiration is fairly constant over the years, varying from 800 millimetres in the south to 900 millimetres in the north. In both cases, being higher during summer, resulting in soils water deficits in this time of the year (Hudson and Meditz, 1990). Excesses and deficits in rainfall are common in Uruguay, for example, there have been significant drought periods, as in the summer seasons of 1891/92, 1916/17, 1942/43, 1964/1965 and 1988/1989. In addition, there have been significant periods of excess such as in 1914, 1959, 1983 and 1992 (Severova, 1997).

Most of Uruguay is a gently rolling plain being a transition from the almost featureless Argentine pampas, to the hilly uplands of southern Brazil. Three quarters of the country is a rolling plateau, interrupted by ranges of low hills *(cuchillas)* that become more prominent in the north as they merge into the highlands of southern Brazil. Even these hilly areas are remarkably featureless, and elevation seldom exceeds 200 m. The highest point in the country is "*Cerro Catedral"* at 541 m. Therefore, altitude is not an important factor in the climatic characterisation of the country (Geographic, 2000; Hudson &-Meditz, 1990).

5.3.1.1.2 - Soils, Natural Grassland and Improved Pastures

Despite the small size of Uruguay, it has a wide variety of soil types. According to CIDE, (1962) Uruguay has five main soils groups[26]. These different soil types determine the

[26] Group I is mainly composed of shallow soils (<20 cm), associated with deeper and heavier soils with good fertility. These soils are developed from basaltic and granitic layers and are dedicated mainly to sheep and beef production. Group II are poor drained deep soils, associated with solonetz. Rice production and extensive mixed grazing are the main activities. Group III is predominantly composed of deep heavy soils that are highly leached (medium to low fertility) associated with a lower proportion of shallow soils mainly developed from granitic materials. Cattle and sheep farming are the most important activity. Group IV dominant soils are deep (>1.5 m), light (mostly sandy) and with low fertility potential. Forestry production and extensive mixed grazing are the main activities. Finally, Group V comprises the soils with the highest potential in the country. They are deep (> 1 m) and heavy textured, showing a moderate to slow permeability and high fertility. They are located in the west part of the country stretching from south to north. In these soils intensive cropping take places alternating intensive cattle and sheep fattening on cultivated pastures. Most dairy farms are developed on these soils (CIDE, 1962).

composition of the plant communities in the natural grassland. Leborgne, in 1994, proposed eight groups of natural grassland that are mainly defined by soil type. These groups are: *Cristalino Profundo (CP) , Cristalino Superficial (Cs), Libertad profund o (Lp), Libertad superficial (Ls), Fray Bentos (FB), Basalto superficial rojo (Bsr) and Basalto Superficial Negro (Bsn)*. These groups have different production potentials as can be appreciated in Table 6.

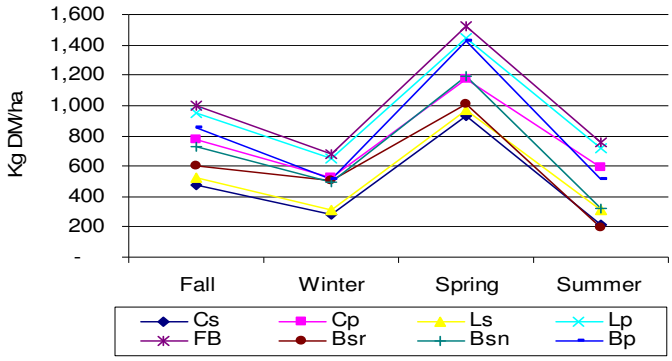
Table 6: Production of the Natural Grassland per Year

	Cs	Cp	Ls	Lp	Fb	Bsa	Bsn	Bp
kg Dry Matter /ha/year	1,900	3,069	2,121	3,762	3,960	2,304	2,726	3,298

Source: Leborgne, 1994

Uruguayan native pastures are characterised by the presence of both summer growing species (C_4) and winter growing species (C_3). The predominant species are (C_4) grasses with low production levels in winter. In autumn and winter the relative frequency of (C_3) species increases, however, it is still lower than that of the summer species. Approximately 50% of winter species are herbs and coarse grasses, while fine ones are scarce. In all vegetation types, the frequency of native legumes is very low. The predominance of (C_4) grasses explains the higher forage production during spring and summer of the Uruguayan Natural Grassland (Barreto, *et al.,* 1998). Figure 10 shows the seasonal fluctuations for pasture production.

Figure 10: Annual Pasture Production According to Soil Type



Source: Leborgne, 1994

Continued grazing of the natural pastures over the last 400 years[27] has caused the erosion of winter grasses by preventing their flowering and seed dispersal. In addition, there has been degradation and loss of species related to continuous stocking, high stocking rates and high sheep/cattle ratios. Degradation signs are the increase of small herbs and stoloniferous grasses, adapted to such grazing conditions, the lower frequency of brunch grasses and the reduction in species numbers (Barreto, *et al.,* 1998).

Most of beef production is carried out on this natural grassland (87%) without any fertiliser or introduced seeds. Considering the area destined for sheep and beef production (13.5 million ha) pasture improvement are only around 1.6 million ha (13%) (NAC, 2000). Since the mid 1960s efforts have been made to overcome the problem of the low winter forage production and the medium to low quality of natural grassland[28]. The use of fertiliser particularly Phosphate (P) but also Nitrogen, and the introduction of legumes have been proposed as the main technology to increase forage production and nutritive value of sheep and beef farm land. The incorporation of Nitrogen (N) and Phosphate (P) increased autumn and winter growth and also total annual production.

When legumes are introduced the common species are: White Clover (*Trifolium repens),* and Bird's Foot Trefoil (*Lotus curniculatus).* For the granitic soils another Bird's Foot Trefoil (*Lotus subbiflorus Cv El Rincon)* is usually, incorporated. *Cultivated pastures,* where the natural grassland is removed and new species are introduced, are other option. The common cultivated pasture mixtures are Tall Fescue (*Festuca arundinacea)*, or Italian Ryegrass (*Lolium multiflorum*) Ryegrass plus White Clover or Red Clover (*Trifolium Pratense)* and/ or Bird's Foot Trefoil *Lotus curniculatus* (Barreto *et.al.,* 1998). Table 7 presents farmland prices and the cost of pasture improvement in Uruguay.

[27] Before that time small herbivorous were present and the vegetation had a greater proportion of scrubs mainly of the genus (Bacharis) and tall branch grasses, except in shallow stony soils. After grazing was introduced several changes occurred and the most important was the maintenance of the natural grassland herbaceous phseudoclimax phase.

[28] Crude Protein (CP) content of the native vegetation varies between 6 and 15% according to the season, botanical composition and the amount of dead material. Maximun values of CP occur during winter and early spring while the minimum occurs in summer with C_3 grasses having higher levels of CP than C_4 grasses. The phosphorous content of most native pastures is generally lower than the average animal requirements. The annual average organic matter digestibility is about 58% with fluctuations accordingly to season and vegetation type (Barreto, *et al.,* 1998).

Table 7: Farmland Prices and Cost of Pasture Improvement

Farmland	US$/ha
Sheep and Beef (Tacuarembo)	500 US$/ha
Sheep Beef and Forestry (Rivera)	700 US$/ha
Cropping (Paysandu)	800 US$ /ha
Dairying North Montevideo	600-800 US$/ha
Best lands of the country	1,100 US$ /ha
Improved Pastures	**US$/ unit**
Fertilisers Phosphate Fertilisers 0-46-46-0 Urea 46-0-0-0 Phosphate/Urea 18/46/46/0	 230 US$/t 209 US$/t 269 US$/t
Gas oil (US$/Lt) (Year 2001)	0.56 US$/lt
Glifosate	2.70 U$S/lt
Improved Pasture (2001/2002)	
Improved Pastures (WC+RC+L+F)	168 US$/ ha
Ryegrass/ Oats	115 U$S/ha
Over-sowing Natural pastures with superior seed and Fertiliser	42 U$S/ha

When the natural grassland is improved the total production is increased considerably. For example, the average annual production in a *Basalto* area increases up to 7,000 kg DM/ha when it is improved with *White Clove*r and *Lotus*. In the *Cristalino* area the average annual production with *Lotus Rincon* increases up to 7,705 kg DM/ha and, with white clover and Lotus increases up to 8,100 kg DM/ha (Plan Agropecuario, 2002; see Appendix I). According to the information presented by Barreto, *et al.,* (1998), annual production of beef cattle grazing an improved pasture can reach 600 kg live weight per hectare in comparison to the 65 kg live weight per hectare grazing natural grassland. However, these strategies have been adopted only by few Uruguayan farmers.

5.3.1.1.3 - Physical Resources and Competitive Advantage

Physical resources provide the main sources of competitive advantage for the Uruguayan beef industry. These resources allow animals to graze outdoors all year around. Consequently, beef produced in Uruguay has a low cost of production (OPYPA, 2002; see Appendix I). In addition, grass-fed beef has been recognised as having lower fat content than grain-fed beef, which is an attribute desired in several markets such as the US and the EU (Guillermo Pigurina, personal communication, 10 December, 2002).

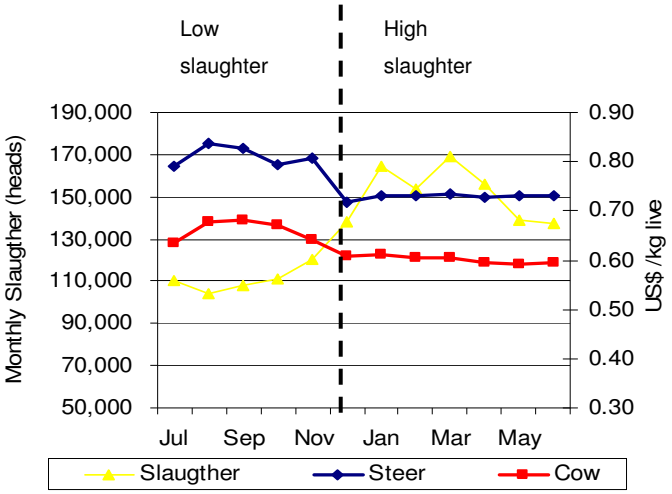
The natural production process, using low levels of external inputs such as fertilisers and chemicals, constitute an advantage to promote Uruguayan beef as "NATURAL CERTIFIED BEEF". Also, Uruguayan beef could easily fulfil the requirements to be

certified as an organic and ecological product, since the production process, as mentioned above, uses few external inputs. Therefore, they could be converted to the production systems required to obtain these certificates without difficulty (Guillermo Pigurina, personal communication, 10 December, 2002; Hugo Revello, personal communication, 26 November 2002).

The pastoral production system in Uruguay also provides some disadvantages. Since beef cattle in Uruguay are grass-fed, pasture production variability has a significant impact on beef production. Given the climatic conditions and topography of Uruguay, the growth rates of both native and cultivated pastures are mainly affected by water deficits and to a lesser extent by temperature. Therefore, forage production is highly variable among years, which determines beef production variability. For example, as a consequence of the severe drought in the 1989/90, annual beef production decreased from 600,000 tonnes live weight to 450,000 tonnes live weight and the stock was reduced from 11 million to 8.7 million (Ilundain, *et al.,* 2002; DICOSE, 2002). Because of the lack of any significant geographic feature in Uruguay the climatic conditions are quite homogeneous along the country, hence, when a severe climatic event occurs it is likely to affect the whole country.

Since most of the beef livestock farming is based on natural grassland, without any type of feed supplementation, the annual variability in pasture production affects the availability of cattle ready to slaughter throughout the year. The highest level of slaughtering occurs from November to June (with a higher concentration in March, April, May) and the lowest level of slaughtering is from July to October. The variability in slaughter throughout the year also affects cattle prices. Figure 11 shows the annual slaughter and price per kilo of cows and steers from 1997/1998 to 2001/2002.). Considering this period the average price for cows was 6% higher in the three central months of the period of low slaughter than the annual average price. For steers this value was 7% (INAC, 2002).

Figure 11: Cattle Slaughtered and price (Steer and Cow period 97/98- 01/02)



Source: INAC, 2002

The annual variability in slaughtering has several consequences along the beef chain. First, it affects the level of usage of the processing plants during the year. According to the information provided by the livestock managers from the processing plants, who were interviewed, the seasonal cattle supply also affects the relationship between the farmers and processors because of the conflicts generated in periods of shortages or surpluses of cattle. Depending on which is the situation, either processors or farmers behave opportunistically trying to take advantage of the situation when it favours them.

The annual variability in slaughtering also affects the quality and type of the product at different times of the year because there are changes in the classes available for slaughter and the weight of animals slaughtered. In winter, the proportion of steers ready to slaughter is lower than in other period of the year because steers perform worse than cows under harsh conditions (such as in winter, when there are shortages of food and low temperatures). Therefore, it is difficult to have many steers ready to slaughter at this time of the year. In addition, animal weight to slaughter and dressing out percentage also vary seasonally. The weights are higher in autumn and lower in spring. Conversely, the dressing out percentages are lower in autumn and higher in spring (Alonso, *et al.,* 1983; INAC, 2002).

The small size of the country allows cattle to move all over the country for a reasonable freight costs. According to the information provided by the cattle purchasing managers of the abattoirs interviewed, the location of the farmers is not a relevant factor in deciding

where to buy the animals when they are seeking for quality. However, when abattoirs are less focussed on buying a specific animal for a particular market they prefer to get cattle from the surrounding areas.

Physical resources also provide sources of competitive disadvantage for the industry in relation to its location. The long border with Argentina and Brazil offers an important source of disadvantage because it is difficult to be free of FMD independently of the situation of the neighbour countries. The border with Brazil of 985 km without any features makes FMD control very difficult. The Argentinean situation also affects the sanitary status of Uruguay. For Uruguay to be free of FMD, the south of Brazil and Argentina has to be free as well. Therefore, Uruguay relies on measures taken by other countries, which are impossible for it to control or modify. The border between Brazil and Uruguay is particularly difficult and cattle have been moved illegally from one country to another. After the FMD outbreak there has been a more strict control than before, but it is still an important weakness of the Uruguayan beef industry (Eduardo Paradiso, personal communication, 11 December 2002).

5.3.1.2 - Human Resources

Uruguay has a population of 3,410,800 and a growth rate estimated in o.77%.The recession in the economy that the country has suffered in the last years has affected the labour market considerably. The unemployment rate reached 15.6% in the year 2001 and the labour wages in real terms have decreased (IE, 2002). According to the information gathered from the interviews in the processing plants, the labour cost is around 8% of the total cost of the plants, and managers from the processing plants did not consider the cost of the labour as a factor affecting the performance of the plants. In conclusion, Uruguay has high availability of low cost labour. Table 7 presents the cost of labour per year.

Table 8: Annual Labour Cost

Labour	(US$/year)
Farm Worker	900 - 1,714
Farm Manager	2,400 - 4,285
Urban Worker (Abattoirs)[29]	3,000

Source: DIEA, 2002

[29] From the information gathered during the interviews an average abattoir employee has a wage of 3000 - 4000 US$ per year depending on position and level of experience.

5.3.1.2.1 - Human Resources in the Primary Sector

The number of people living in rural areas has decreased in the 20th century and now it is around 7.3% of the total population (248,154 inhabitants) (The World Gazetteer, 2002). The number of people living on farms has also decreased considerably. According to the NAC (2000), the number of people living on farms has decreased 40% since 1970, being 189, 838 in 2000. Uruguay has one of the higher literacy rates[30] in Latin America, at 97.3%. Table 8 shows the level of education of the people who live in rural areas. Although, this information represents the situation over the whole rural population of Uruguay, and not only the sheep and beef farmers and their employees, it can be used as a good reference about their level of education. According to this information, 97% of the people who live in rural areas have some type of education and 57% have completed only primary school.

Table 9: Level of Education of the People living in Rural Areas

Level of education	Percentage
None	2.4
Primary school (complete)	38
Primary school (did not complete)	17.8
High school (complete)	12.2
High school (did not complete)	9.8
Technical[31] studies (complete)	5.1
Technical studies (did not complete)	1.4
Tertiary education (complete)	8.4
Tertiary education (did not complete)	3
Other	1
N/A	0.9

Source: NAC, 2000

As can be appreciated in table 8, the level of education in the rural areas is low. This factor has been identified as a limiting factor for farming activities in Uruguay. The average number of permanent workers[32] per farm (considering only the farms where beef is the main source of income) is 2.6 and 6 workers per 1000 ha (NAC, 2000). As will be presented later, labour per farm is higher than in New Zealand, which shows that Uruguayan sheep and beef farms have lower productivity per worker. Although, they are compensated with more workers, due to their low costs.

[30] Defined as the people of 15 and over that can read and write.

[31] This refers to high school level education which has also a training in agriculture related activities (Farm management, farm machinery management and so on)

[32] Considering all types of farmsit is around 2.7 workers per farm and 10 workers per 1000 ha.

At the managerial level, the low level of education is a problem because it has affected the decision making process, particularly, when deciding to incorporate technology in the production systems. Sheep and beef farmers in Uruguay have been the last to incorporate the technology available in comparison to other pastoral farmers, such as dairy farmers (Carlos Maria Uriarte, personal communication, 8 December 2002).

Farmers had a bad experience in the 1960s when the IPA ("*Instituto Plan Agriopecuario*") tried to introduce new grasses and pastures from New Zealand. The experience was unsuccessful because New Zealand's model was not adjusted to the Uruguayan conditions. For example, pastures were introduced in inappropriate soils and with inappropriate sowing techniques (Alonso, *et al.,* 1983; Carlos Maria Uriarte, personal communication, 8 December 2002).

The lack of managerial ability of farmers can also be appreciated in the lack of information gathered by farmers. Only 38.5% of the farms keep records of the farm performance (NAC, 2000). People interviewed in the processing plants also agree that farmers in Uruguay have no idea about the cost of production of their animals. They also stated that farmers did not make adequate selling decisions since they are focused on short-term goals and they could not see long-term benefits of a particular decision.

5.3.1.2.2 - Human Resources in the Processing Plants

All managers interviewed from the six abattoirs in Uruguay were unanimous that labour availability, cost and level of qualifications and skills were not a problem limiting the processing sector. The managers interviewed agreed that, due to the high availability of labour, it is possible to make a good selection among the pool of labour available and also to compensate any inefficiency using more labour.

With regard to the level of education, most of the employees have completed primary school and the younger ones, in most cases have completed high school. There are few people with tertiary level of education and they are working mainly in managerial positions. In some of the plants visited, managers tried to include more educated people with the older ones, who have lower level of education, but more experience.

In general, they work one shift on slaughtering (8 hours) and two shifts (8 hours each) on

de-boning. According to Vilanova & Patrone (2002), the top Uruguayan abattoirs have an index of 1.5 animals slaughtered /hour /person (for abattoirs of 80 cattle slaughtered per hour), and 1 animal slaughtered/hour/person (for abattoirs with capacities for 30 cattle per hour). Comparing this index with international standards it is lower, for example, beef processing plants in the US have an index of 2.8 cattle slaughtered/person/hour. In the de-boning process it has been reported that 14-18 forequarters could be processed per hour per person. Payment according to productivity per person is common in the industry (Vilanova & Patrone, 2002), and, according to the managers interviewed, this has had an important effect on increasing the efficiency of the process.

5.3.1.2.1 - Human Resources and Competitive Advantage

The low cost and high availability of labour represents the main source of competitive advantage for the beef industry in relation to human resources for both the primary sector and the processing companies. The level of education of the farm workers is mainly at the level of primary school but this is not limiting for carrying out farm activities. However, the managerial ability of farmers is one of the limiting factors for increasing performance in the farming sector. At the processing industry the pool of labour available allowed plant managers to select the best labour among the people available. Therefore, labour qualifications and skills have not generated any problems.

5.3.1.3 - Knowledge Resources

The University through the College of Agronomy and College of Veterinary are the main organisations responsible for producing professionals to work in the area (agronomist and veterinarians). Postgraduate qualifications are uncommon in Uruguay. There are master degrees in some areas (business management) but PhDs are non-existent. This situation is limiting the development of knowledge for the country, since there is no research in boundary areas where room for innovation can be generated.

Research is mainly undertaken by the National Institute of Agriculture Research (INIA)[33]. According to de Mattos (2002), who is the head of the animal production unit of INIA in Tacuarembó, INIA has had an important role in the technological development of livestock farming in Uruguay. Its main role has been raising the

[33] INIA is a public non- governmental institution partially funded by the government and by the farmers who provide 0.4% on the top of the sales value.

productive limitations of livestock production by developing new technologies and adapting technologies generated somewhere else (e.g. New Zealand). The information generated by INIA's researchers is available to all farmers through field days and research publications.

In beef production, INIA has traditionally conducted research in the primary sector in relation to breeding improvement, pasture and grazing management, reproduction efficiency, production productivity and so on. Although, there is still place for improvement there is technology available for ameliorating the main limitations of the farming sector. The low performance of beef cattle production has been a consequence of a low adoption of the technology available by farmers (de Mattos, personal communication, 6 December 2002)

Research in other areas of the beef chain such as beef processing, product development and beef marketing has been identified as limiting in previous research (COMISEC, 1995; Vega, 2001). However, lately, INIA has changed its focus from the primary sector towards the whole beef chain. As an example, there have been several studies on beef tenderness, pH, colour, effect of animal fed composition on beef quality, fat composition and type of fat acids. There is also research on organic and ecological beef production systems, aiming to reach certain niche markets. Lately, INIA has also been working on environmental and animal welfare issues knowing that the final consumer will consider these factors when purchasing the product (de Mattos, personal communication, 6 December 2002)

There has been an important participation of the private processing plants in the research developed by INIA. For example, in November/December 2002, there was an study in 11 main exporter plants to identify the main problems of their processing systems by a group of Uruguayan (INIA) and American (Colorado State University) researchers.

Ninety five percent of the information generated by INIA is communicated to the general public. However, when research is related to the processing industry if the specific research is funded by a particular company the information is communicated only to this company. Since INIA is funded by farmers, research in the processing sector may not be considered beneficial by farmers. De Mattos argued that there has not been any problem

until now but it could be a problem if farmers do not see the benefits for themselves of this research in the processing plants.

The LATU (Technological Laboratory of Uruguay) carries out research for the processing industry in relation to product transformation process and new product development. However, according to the managers interviewed the role of LATU has been very passive and the initiative always comes from the processing companies. According to the opinion of some managers interviewed, new technology is generally generated overseas and incorporated directly by the companies.

5.3.1.3.1 - Knowledge Resources and Competitive Advantage

Uruguay is far from being a world leader in the generation of research in the farming sector but the level of knowledge available has been enough for raising the main productive limitations in farming. In the processing sector less information has been generated but it is available from other countries, such as New Zealand, Australia, the US and the EU countries. Marketing research is probably the most limiting factor in Uruguay as was stated by previous researchers in the Uruguayan beef industry (COMISEC, 1995; Vega 2001). In summary the research carried out in Uruguay is not likely to bring any revolutionary technology, which could become a source of competitive advantage, since it has been more focussed on solving problems than searching for new opportunities.

5.3.1.4 - Capital Resources

The cost of capital and its availability has been one of the major problems, not only for the beef industry but also for all the economic sectors in the country (Antia, 2002; Picerno & Sader, 2002). It has been 10-12 % in American dollars when return on assets has been 2-3% on average farms.

The level of indebtedness with the banks has increased considerably, from 305 million US$ dollars in 1991 (33% of the Agricultural GDP) to 1,228 million US$ in 1999 (105% of the agricultural GDP). In 2001, most of the farmers (98%) owe in American dollars (US$) and, mainly, to the State Bank (BROU[34]) (64%) (Antia, 2002). Table 8 shows the development of indebtedness in the agricultural sector in Uruguay.

[34] Republic Bank of Uruguay

Table 10: Level of Indebtedness in the Agricultural Sector

	Indebtedness (million US$)	Credit/GDP(agr.) (%)	Currency (%)		Creditors	
			US$	PESO $	State Bank (BROU)	Private Banks
1990	315..9	37.8	39.7	60.3	58.9	41.1
1991	304.6	33.3	40.3	59.7	63.7	36.3
1992	382.4	34.5	50.6	49.4	62.8	37.2
1993	493.2	45.6	58.5	41.5	62.3	37.7
1994	553.7	40.9	69.0	31.0	65.7	34.3
1995	622.6	38.1	75.6	24.4	65.0	35.0
1996	754.4	46.6	85.0	15.0	68.6	31.4
1997	935.4	58.4	91.6	8.4	71.1	28.9
1998	1155.1	76.3	94.6	5.4	69.2	30.8
1999	1228.0	105.3	96.8	3.2	70.3	29.7
2000	1209.5	102.0	97.6	2.4	66.7	33.3
2001[35]	1212.6	110.0	98.2	1.8	63.7	36.3

Source: Antia, 2002 based on the information provided by BCU[36] and BROU.

In 2002 the financial system in Uruguay crashed. Savings were reduced 50% in the first seven months of the year, because of the distrust in the financial system by the savers. According to the Ministry of Economy, the money in the hands of savers (out of the financial system) was around 1,000 million U$S. The difficult financial situation was enhanced in 2002, when the private banks and the BROU stopped the financial assistance. The agricultural sector was the most affected because of the bad reputation of the sector in serving their debts. Moreover, the most affected institutions were the ones that used to lend more to the sector (BROU, Banco Comercial, Banco de Credito y Caja Obrera) (Antia, 2002).

In this scenario, some private investors appeared interested in investing in the livestock production sector. This is a promising alternative since there is an important amount of capital in the hands people. The rate of return, considering total farm capital of a livestock farm, is not higher than 2-3%. However, considering only short-term investments in the system (such as animals for finishing) the return on capital is higher and more secure than many other options in Uruguay (Carlos Maria Uriarte, personal communication, 8 December 2002).

All the processing industry managers interviewed said that the most important problem of the beef industry it is the lack of finance. Processors generally pay farmers in 90 days, or even longer, depending on when they receive the payments from overseas. There is no

[35] Values until September 2001

[36] Central Bank of Uruguay

capital available to pay farmers earlier. The cost of the capital that they could get in the country now is too expensive and would make the business unprofitable.

5.3.1.4.1 - Capital Resources and Competitive Advantage

The cost of the capital and, lately, its availability have been the main limitation for farmers and processing companies wanting to invest on their production systems or even to carry on the normal operations. After the financial crisis new sources of private capital appeared for the livestock farming system which represent a new opportunity for the farming sector. However, it is not possible to make any conclusions about the possible result of this alternative, because it has started at the end of 2002.

5.3.1.5 - Infrastructure

Services at the farm level have increased considerably lately with 48.3 % of the farms having phone service and the 67.3% of the farms having electricity. In regard to farm access, 86 % of the total farms in Uruguay have permanent access (NAC, 2000). Despite the fact that infrastructure is adequate in Uruguay, it is likely that the level of resources at the farm level and in the rural communities are still a limiting factor for providing good living conditions to stay in rural areas, for example, it is common the lack of cultural, social and sport infrastructure in rural communities

Most of the beef exported from Uruguay is exported in refrigerated containers which leave from the Montevideo Port[37]. In July 2001, the Terminales Cuenca del Plata S.A. was conceded to the Nelsury. S.A group (60% foreign capital[38], 40% Uruguayan capital[39]) who will, for 30 years administer 80% of the Containers Terminal in the Montevideo Port. The ANP (Associacion Nacional de Puertos) kept the rest 20% of its ownership. After the privatisation of the Containers Terminal in Montevideo it is expected that there will be an increase in the efficiency of the terminal. The objective is to triplicate the movement of containers in 15 years (El Pais Agropecuario, 2001). The managers in the processing industry were expecting some improvement as a result of the private management of the container terminal.

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[37] Usually the containers used in Uruguay can accommodate 12 tonnes of chilled beef and 14 tonnes of frozen beef. The difference is because the chilled beef needs more air in the container for air circulation. The containers are taken to the processing plants by track to be fill ed and are then transported back to the port in Montevideo

[38] These are, Seaport Terminal and Katoen Natie from Belgium

[39] Zona Franca de Montevideo, SAMAN, and Fanapel, among others.

5.3.1.5.1 - Infrastructure and Competitive advantage

The relevant infrastructure for the beef industry in Uruguay, such as farm roads, accessibility to the processing plants and ports do not present any limitations for the competitiveness of the beef industry. The relevance of the industry in the country and its long existence in the country defined that the relevant infrastructure for the industry has been extensively developed. However, the lack of adequate infrastructure in rural areas is likely to have contributed to people moving from the farms to the cities.

5.3.1.6 - Summary of Factor Condition and Competitive Advantage

Table 11 summarises the main findings in relation to the effects of factor conditions on the competitiveness of the beef industry. This table summarises the factors that are likely to contribute with competitive advantage or competitive advantage in the industry, which were, previously, discussed.

Table 11: Summary Factor Conditions and Competitive Advantage

Factor Conditions	Competitive Advantages	Competitive Disadvantages
Physical resources	• Low cost of production based on a low input grass-fed production systems • The product obtained in the production system can easily been certified as natural or ecological and take advantage of any market segment that may demand this product • The small size of the country allows movement of animals to plants and beef to the ports without difficulties and at a low cost.	• The borders with Brazil and Argentina make difficult to obtain and maintain a status of free of FMD to enter and keep new markets • Production variability among years depending on climatic events • Seasonal pasture production defines the seasonal slaughter variability and, hence, the seasonal use of the processing plants and seasonal variability in quality and quantity of product placed into the market
Human resources	• Low cost of Labour • High availability which allows good labour selection	• Low level of education and poor managerial ability of farmers have contributed to the low production level of the farming sector • Lower productivity per hour in the processing industry than international counterparts .
Knowledge Resources	• The information available is adequate to rise the productive constraints in livestock farming • Most of the information generated can be used by everybody at the farm level	• Lack of research for the processing sector in product development • Little marketing research • Information generated in the processing plants is focussed only on the export plants
Capital resources	None	• High cost of the capital • Low availability of capital
Infrastructure	• Good access to farms, to the processing plants and adequate port infrastructure to allocate the product internationally. • Container terminal is expected to increase the efficiency and reduce beef exports costs	• Farm services (power and electricity) and community services in rural areas (school, health services) prevent farmers and farmers family from living in their farms

5.3.2 - Demand Conditions

The demand condition determinant relates to the characteristics of the demand, which are relevant for generating competitive advantage in a particular industry, for example, when sophisticated consumers present a stimulus for the firms in the industry to upgrade and innovate. This section presents the domestic and international demand for Uruguayan beef and analyses its effect on the sources of competitive advantage of the industry.

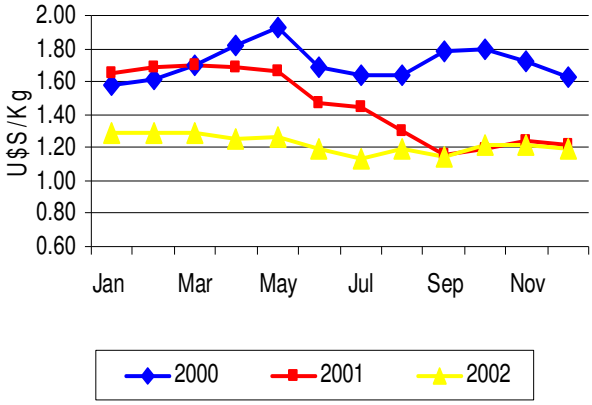
5.3.2.1 - The Domestic Market

The domestic market is the most important single market for Uruguayan beef and remains stable at about 180,000 - 200,000 tonnes product weight, requiring the slaughter of approximately 700,000 - 900,000 head (Vega, 2001; Vernazza & Cesar, 2002). Over 400 wholesalers buy beef from the slaughterhouses and sell it to supermarket chains and butcher shops. Some of the wholesalers are companies owned by the abattoirs or butcher groups. There are around 3,000 butcher's shops in the country. In Montevideo there are nearly 100 supermarkets, which are continuously increasing their share in food sales. In Montevideo, the number of butcher shops is decreasing. In 2001, there were 600 butchers shops, 50% fewer than the 1,200 shops existing in 1988. In Montevideo, in 2001, 61.1% of the beef was sold in butchers shops, and 38.9% in supermarkets. Meanwhile, in the rest of the country most of the beef is sold in butcher shops (Vernazza & Cesar, 2002).

Uruguay has the second highest beef consumption per capita (after Argentina) at 60 kilos per person per year. The second meat in importance, and the main competitor to beef, is poultry. Its annual per capita consumption is around 18 kg per person per year. Broiler consumption is expected to continue to grow, gradually, as prices have dropped significantly in the past years in comparison to beef. Behind beef and poultry is sheep meat with consumption per capita of 11 kg, followed by pork at 9 kg (Vernazza & Cesar, 2002). Beef is largely consumed in urban areas, while lamb and mutton are predominantly consumed in rural areas. All beef cuts are popular in Uruguay and buyers consume different cuts according to their income levels. High quality lean and tender cuts from British breeds are demanded by consumers with higher purchasing power, while forequarter cuts are popular among less affluent consumers (Vega, 2001).

Beef prices in the domestic market were significantly reduced in the year 2001 and 2002 after the outbreak of FMD which stopped beef exports so all the product went on to the saturated local market. Figure 12 shows the wholesales prices for the years 2000-2002.

Figure 12: Over the Hook Wholesales Price (US$/kg) tax included



Source: INAC, 2002

Vernaza & Cesar (2002) studied the domestic consumption of beef in Uruguay. They considered three income levels, low, medium and high. They found that beef consumption was highest in the medium income level group. The low-income level group consumed less beef than the medium level group because of money restrictions. The high-income level group consumed less than the medium income group because of different preferences. Processing plants managers interviewed also stated that the level of hygiene and safety that Uruguayan consumers require depends on the level of income, and also on where they purchase the product.

Vernazza & Cesar (2002) also argued that there is little previous research about the domestic consumer's preferences in Uruguay in relation to beef attributes. Furthermore, consumers have little information about the products, and the information that is provided is not available all over the country. For example, there are differences in the information available between the capital city and the rest of the country. According to the opinion given by the managers that were interviewed in the processing plants, the Uruguayan consumer's are less sophisticated than the consumers from international markets, such as the EU countries. They also stated that most Uruguayan consumers require specific cuts

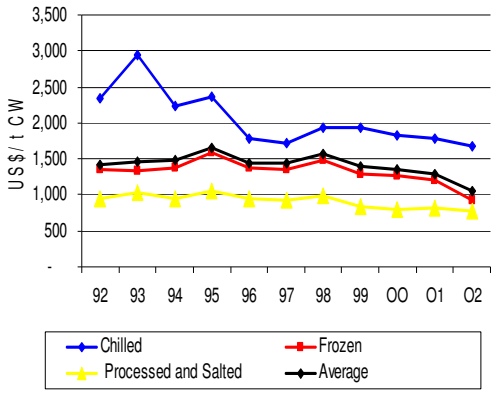
that are not demanded by other international markets and also that most consumers are not willing to pay more for differentiated products, such as organic of ecological beef.

5.3.2.2 - The International Market

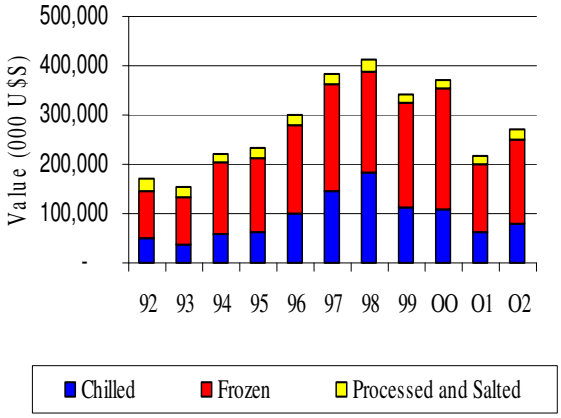
The maximum level of exports was established in 2000 when the country exported 272,000 tonnes carcass weight, which represented 60% of the amount produced (453,333 tonnes carcass weight). The volume of beef exported has increased considerably since the mid-1990s when Uruguay was declared free of FMD without vaccination. The increment was 75% compared to the average volume exported between 1985 and 1995 of 155,000 tonnes carcass weight (Ilundain, *et al.,* 2002). In relation to the type of product exported, it is mainly frozen and boneless. Figure 13 shows the value exported by type of product (frozen chilled, processed and salted) and the average price received from them.

Figure 13: Uruguayan Beef Exported by Product

a) Prices FOB (US$/tonne carcass weight)



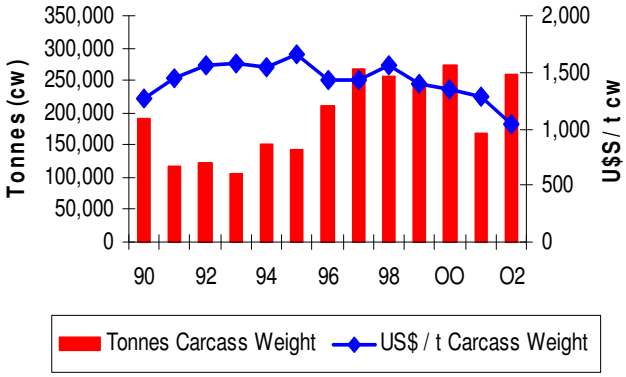
Values FOB (US$)



Source: INAC, 2002

When Uruguay was declared free of FMD without vaccination, Uruguayan beef (frozen and chilled) could enter to the US, Canada, Japan and Korea. The access to these markets caused a significant increment in the volume of beef exported, however, there has not been any significant improvements in the average price received from exported beef (Ilundain, *et al.,* 2002). Figure 14 shows the volume of beef exported since 1990 to 2002 and the average price received.

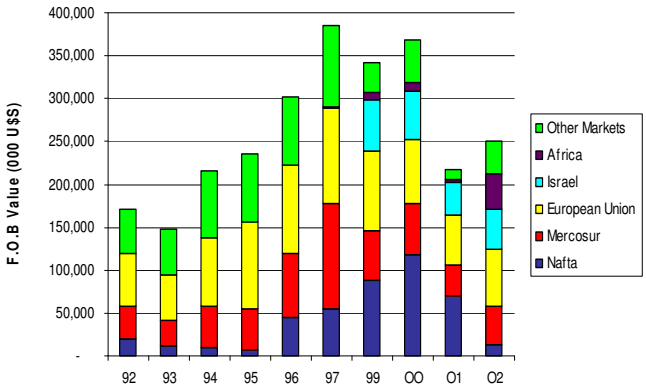
Figure 14: Beef Exported (Volume and Price per tonne)



Source: INAC, 2002

Similarly, Figure 15 shows the destination for Uruguayan beef. In 1997 there was a significant participation of NAFTA as an importer of Uruguayan beef. However after the outbreak of FMD in 2001, NAFTA and the Asian countries stopped importing Uruguayan meat products. Since that moment NAFTA only imported cooked and canned beef.

Figure 15: Value Exported by Market



Source: INAC, 2002

The main Uruguayan markets (before the outbreak of FMD in 2001) were North America (the US and Canada), EU, MERCOSUR, Israel and ASIA (Japan). At the end of the year 2002 and beginning of 2003 the North American market has been recovered. The EU is the most sophisticated market with tight requirements and products specifications. The main products to the EU market are hind-quarters boneless beef (it was chilled 28% and frozen 39% in 2000) and the rest is exported processed and salted. Uruguay has 6,300 tonnes of beef under the European "Hilton" quota that offers a lower tariff. Total exports to the EU in 2002 totalled 66,294 thousand US$ (FOB value) (INAC, 2002).

Israel only purchases frozen forequarter, and therefore represents an important market for products, which are difficult to sell, at a good price, if a country does not have access to the US manufacturing market (as happened when FMD appeared in Uruguay). All beef products need to be from animals killed according to the kosher ritual[40].

MERCOSUR countries import mainly chilled beef (it was 79% in 2000). Brazil and Argentina buy both boneless and bone-in beef from Uruguay. MERCOSUR countries have always been an important market for Uruguayan beef, particularly, Brazil in regard to bone-in beef. Brazil and Argentina have a population around 200 million people and Uruguay has free access to these markets under the MERCOSUR trade agreement. The characteristics of the demand from Brazil and Argentina are not highly sophisticated and the markets are similar to Uruguay. Both Brazil and Argentina are beef producers, therefore the competitiveness of the Uruguayan beef in the MERCOSUR market depends on the relative values of the currencies from these countries. Asian countries, mainly Japan and Korea, buy boneless and frozen beef. Other markets such as African countries and Middle East countries buy low priced beef (INAC, 2002; Ilundain, *et al.,* 2002). Table 12 presents the average price received per tonne carcass weight (FOB prices) in 2000 when Uruguay had access to the free of FMD markets.

Table 12: Uruguayan Beef Price

Market	Price FOB US$/ tonne carcass weight
EU	1,907
Japan	1,552
Israel	1,383
MERCOSUR	1,303
Nafta	1,175
African Countries	1,032

Source: INAC, 2002

The exporter abattoirs, which are licensed to the EU and US markets, are the ones that have the highest technology and better infrastructure. The frequent inspections from the importing countries require the abattoirs to maintain high standard of hygiene, safety and quality of the product. The Uruguayan government through INAC (which ensures that the

[40] All the export slaughterhouses in Uruguay have the infrastructure for this type of ritual. There are a permanent group of Jewis people in most of the slaughterhouses to do the appropriate inspections. After the market liberalisation in 1993 in Israel, private companies have entered the market, before that time the meat was imported through government agencies. Markets from Muslims markets such as Algeria, Egypt, requires the Halal procedure, which is also available in some plants.

product complies to market specifications) and MGAP (controlling the hygiene and safety of the product and the plant), also have an important role in ensuring the quality of the product.

These abattoirs are, also, the most advanced in relation to product specifications, quality control and hygiene. All of them implement HACCP[41] methods and all the quality control procedures demanded in the strictest markets. There are no ISO 9000 abattoirs in Uruguay but there is at least one of the export plants, which is likely to obtain it in the short term. The export plants have also developed new products such as ecological beef, which is being marketed in Europe, and brands associated with specific importers in Europe. Although, these markets only represent a small proportion of the Uruguayan beef exported.

In summary, the infrastructure in the processing plants, which are licensed to export, is enough to comply with the most sophisticated demand and strictest markets. There is also adequate infrastructure in the country for undertaking Kosher and Halal procedures for Israel and Muslim countries, respectively.

5.3.2.3 - Demand Condition and Competitive Advantage

According to Porter's Diamond Framework, the most important market for any industry is home located, since it is the most immediate environment for the firms in the country. However, as presented in Chapter 2, this point of the diamond has been severely criticised and it has been argued that there are other off-shore markets that may have a stronger influence on the source of competitive advantage of the nation's firms (Cartwright, 1993). This situation is very common in countries with a small domestic demand, which sell most of their production internationally, as is the case of Uruguay.

Considering the factors that Porter described as relevant for a domestic market to be a source of competitive advantage, Uruguayan domestic demand does not provide any source of competitive advantage for its beef industry. The demand for beef in Uruguay is neither highly demanding nor sophisticated and it is mainly defined by the level of income of the population. In addition, this demand does not anticipate buyers' need in

[41] Hazard Critical Control Point

other nations. Generally, abattoirs which kill for the domestic demand have a lower requirements regarding the level of hygiene, sanitary controls, and infrastructure than the plants that kill for the international market.

In contrast, the international market is the main factor stimulating traceability, hygiene, and sanitary controls. Inspections from buying countries have been a stimulus for innovation in beef processing. There are several examples of how the international markets have constituted a stimulus for the firms in the industry to innovate. One example is the EU market. In order to comply the narrow specifications and high quality and hygiene requirements of the Hilton market, processing plants have changed to be adequate to these requirements. Another example is the Israel market, which requires a special ritual for cattle slaughter, and the plants have changed accordingly. The MERCOSUR market is very important for Uruguay in relation to its accessibility and size but, in general, it is not a sophisticated market and the requirements for exporting to this market are lower than exporting to other international markets such as the US, EU and some Asian countries. Managers form the processing companies described, during the interview, that this market has similar characteristics as the domestic Uruguayan market.

5.3.3 - Firm Strategy, Structure and Rivalry

Another determinant of Porter's Diamond Framework is related to the context in which firms are created, organised and managed as well as the nature of domestic rivalry. According to Porter, the goals, strategies and ways of organising firms vary widely among nations. When the structure and strategies applied by the firms in the country are adequate for a particular industry, it constitutes a source of competitive advantage for this industry. This corner of the diamond is also related to the level of rivalry among the domestic firms in the industry. As was presented in Chapter 2, one of the most significant findings of Porter's model was that the presence of vigorous domestic rivalry promotes innovation and upgrading of the domestic firms, which is required to create and sustain competitive advantage in any industry. This section analyses how firms within the Uruguayan beef industry are organised and managed, considering the primary sector and the processing sector. This section also analyses the rivalry existing in the processing firms, since there is no significant rivalry at the farm level.

5.3.3.1 - An Overview of the Primary Sector

Uruguay has a total farm land area of 16 million ha, and animal pastoral production (sheep, beef and dairy) occupies 82% of this area[42]. Beef is the most important of the pastoral production activities and uses around 75% of this area. Cattle and sheep graze together in most of the farms, although, 44% of the farms are dedicated exclusively to beef production (NAC, 2000). In the last decade, Uruguay has consolidated its position as a beef producer increasing the number of farms where beef is the main source of income as can be appreciated in Table 13.

Table 13: Number of Farms and Area According to the Main Source of Income

	2000		1990	
	N^0 farms	thousand ha	N^0 farms	thousand ha
Dairy farms	6,037	1,010	7,104	854
Beef farms	28,245	12,686	12,976	7,313
Sheep farms	4,097	951	16,421	6,268

Source: NAC, 2000

In 1990, sheep production was the main source of income for 30% of the total numbers of farms, but only for 7% of the farms in 2000. The reasons for the reduction in sheep numbers and sheep farms have been the low world wool price (which has been the main product for Uruguayan sheep farmers), and also the more favourable environment for beef production (such as a higher international prices and access to new markets) (Ilundain, *et al.,* 2002).

Consequently, there has been a sharp fall in the sheep stock in Uruguay, from 26 million head in 1991[43], to nearly 11 million head in 2002 (DICOSE, 2002). Despite the reduction in sheep stock number, there are still sheep on 28,000 farms (NAC, 2000). Sheep are presented mainly in the farms located in the less productive pastures of the country. In 2002, there were 11,115,000 head of beef cattle, and 750,000 head of dairy cattle and 10,986,000 sheep. The main beef breed is Hereford (70%) followed by Angus (DICOSE, 2002; NAC, 2000). Table 14 presents the stock composition in Uruguay.

[42] Sheep and beef farms, occupy 12.5 million ha and dairy farms 1million ha.

[43] The higher number of sheep in 1991 was the severe drought that affected the country in the summer of 1989/90 reducing the cattle stock. In contrast the number of sheep increased because of their better tolerance to dry conditions (DICOSE, 2002)

Table 14: Livestock by Class (000 heads)

Category thousand heads	2002
Bulls	**164**
Cows	**4,551**
breeding cows	*4,101*
feeder cows	*450*
Steers	**2,469**
steers 1-2 years	*966*
steers 2-3 years	*844*
steers + 3 years	*659*
Heifers	**1,421**
heifers 1-2 years	*1,001*
heifers +2 years	*420*
Calves	**2,510**
Total Beef Cattle	**11,115**

Source: DICOSE, 2002

Most sheep and beef farms are family owned, and corporate farming is exceptional. Usually, the farmers' families live in the city, either in the capital of the country or in other cities or towns close to the area where the farm is located. An important feature of the farms in Uruguay is the high variability among farms in relation to the production systems, the technology adopted, the resources available, and the managerial ability of the farmers, which define different productive and economic performance. The information presented in the next section includes the variability in farming systems and performances that can be appreciated, and that were possible to obtain during the field study in Uruguay. Four main sources of information were used to describe the performance of the firms in the primary sector, OPYPA, FUCREA, PRONADEGA, and IPA. These sources are described in Appendix I.

Sheep and beef production has been characterised by the low adoption of the available farming technologies (Alonso, *et al.*, 1983; COMISEC, 1995). It can be appreciated in the high proportion of natural grasslands (without any fertilisers of seeds), which is 93% of the area where this production is carried out, and the low use of any type of feed supplementation (NAC, 2000). As a consequence of that, low productive performance is common in the country, which can be seen in the historically low production indices, such as an average birth rate of 64-65% and an average annual beef production of 50-60 kg beef live weight per ha (Alonso, *et al.*, 1983; COMISEC, 1994, Arroyo, 2001).

The low performance of the farming sector in Uruguay has been considered as an important reason for the low performance of the whole beef chain (COMISEC, 1995).

The following table present information about the physical performance of the last years from FUCREA groups and considering three level of performance-low-average-high. This information is from farms, where more than 80% of the income comes from beef production.

Table 15: Beef Production (kg live weight /ha)

	Low 25%		Average		High 25%	
	KG BEEF /HA	**EQ. BEEF/HA**[44]	**KG BEEF /HA**	**EQ. BEEF/HA**	Kg Beef /ha	Eq. Beef/ha
00/01	62	84	77	98	117	131
01/02	74	90	80	95	99	114

Source: FUCREA, 2002

In Uruguay there are three types of farms, which are different from each other in their production systems. First, the breeding farms which produce calves and have a cowherd. Second, farms where calves or young steers and/or heifers are bought to finish them. Finally, there are farms where the whole production process is done, breeding, rearing and fattening.

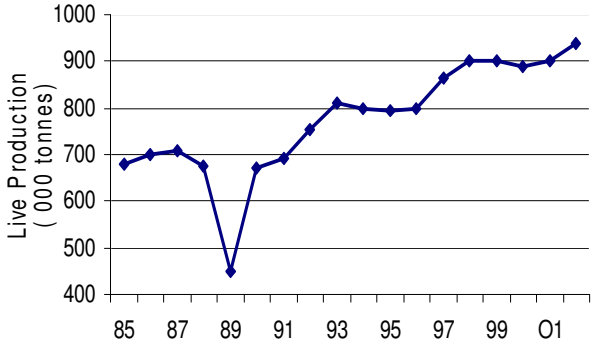
According to the information presented by IPA, in a study of 51 farms (including 16 breeding farms, 21 vertically integrated farms and 14 feeders farms) in the year 2001/2002 the birth rate in the breeding farms was 76%, and beef production was 53 kg live weight/ha. Considering the vertically integrated system, the birth rate was 78% and they produced 82 kg live weight/ha, while the feeder farms produced 93 kg live weight beef/ha (Plan Agropecuario, 2002). This information can not be generalised to all the farms in the country (because they did not use a representative sample), however, these results are supported by other sources that show that cow-calves producers have a lower productive performance than the vertically integrated farms. Generally, the vertically integrated farms are located on the best pastures of the country and they have a higher proportion of improved pastures and higher levels of fed supplementation (Ilundain, *et. al.*, 2001, DIEA, 2001, NAC, 2000).

[44] National bovine meat, wool, ovine meat and milk production are all converted into a beef equivalent in order to obtain the figure of beef equivalent produced. Beef alone make up to 75% of the coefficient.

The level of production increases significantly when intensive production systems are applied. Farms on an intensive production system produced 300 kg live weight/ha (Simeone, 2001), and information presented by INIA, shows levels of production at 600 kg live weigh/ha when cattle were grazing improved pastures (Barreto, *et.al*, 1998).

After a period of 50 years of performance stagnation, beef production started a significant improvement in its productivity in the early 1990s[45] (Arroyo, 2001). All the observed improvements have been a consequence of an increment in the use of improved pasture, fed supplementation and the early and temporary weaning techniques that have been started to be used to improve the reproductive efficiency of the breeding herd. The area of improved pastures dedicated exclusively to sheep and beef production has increased from 780,000 ha in 1990 to 1,600,000 in the year 2000 (Arroyo, 2001). Figure 16 shows beef production evolution.

Figure 16: Beef Production (Live weight)



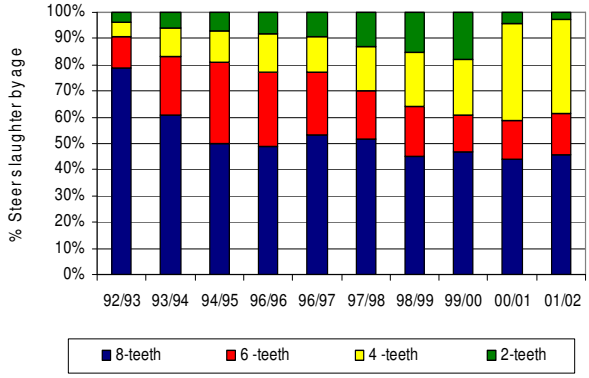
Source: (OPYPA, 2002)

There were also other important changes. The historically low extraction coefficient (annual slaughter/ total cattle) has increased, being consistently higher in the last years at around 18-20% in comparison with 12-15% previously. In addition, the productivity measured as equivalent beef produced per ha[46] increased from 69 kg/ha in 1990 to 82.5 kg/ha in 2001 (Ilundain, *et al.,* 2002). In 1992, 80% of the slaughtered steers were older than 3.5 years. However, in 2001 steers older than 3.5 years were less than 45% of the steers slaughtered (see Figure 17).

[45]After the devastating drought, which severely affected the industry in the year 1989/90.

[46] National bovine meat, wool, ovine meat and milk production are all converted into a beef equivalent in order to obtain the figure of beef equivalent produced. Beef alone make up to 75% of the coefficient.

Figure 17: Steer Slaughter by Age

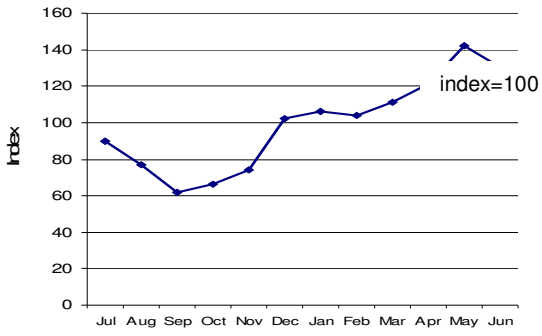


Source: INAC, 2002

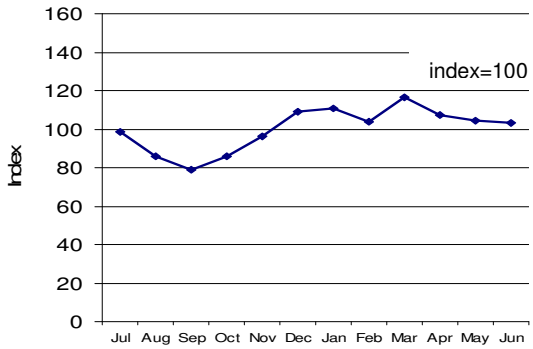
A reduction in the slaughter seasonality has also been appreciated. As can be seen in Figure 18. Graph (a) represents the slaughter seasonality from 75/76 to 81/82 and it has a higher variability than graph (b) that represents the slaughter seasonality in the 1990s.

Figure 18 Monthly Index[47] of Cattle Slaughter

a) Years 75/76 to 81/82



b) Years 91/92 to 01/02



Source: INAC, 2002

When considering cost of beef production[48] there are also an important variability

[47] This index was calculated as follows. The average annual slaughter was calculated for the period 75/76- 81/82 and also for 21/92-01/02, and then the index was calculated by dividing the average slaughter of the period by the average annual slauther.

[48] The information related to cost and prices are presented in American Dollars (US$), since most of the inputs and products related to the beef industry are traded in this currency, except for wages, taxes, living expenses, which are commercialised in *Pesos Uruguayos* ($).

correlated with the physical resources of the farms (soil type) size of the farm, farmer managerial ability and production systems. It is impossible to provide economic information for all the type of farms that exist in Uruguay, so in this research some available sources are presented and they give an idea about the performance that only some type of farms and under certain conditions are able to obtain. In this research three main source of information were considered, namely, OPYPA[49], FUCREA[50], PRONADEGA[51].

Table 16: Average Cost (US$/Kg beef live weight)

	OPYPA	PRONADEGA	FUCREA		
91/92	0.43				
92/93	0.50				
93/94	0.52				
94/95	0.53				
95/96	0.50				
97/98	0.52	0.78			
98/99	0.50	0.80			
99/00	0.47	0.68	Inf. 25%	Average	Sup. 25%
00/01	0.47	0.65	0.87	0.58	0.44
01/02	0.48	-	0.66	0.49	0.38

The cost per kilo presented in this section comes from different sources to consider different farmers and different production systems. Table 17 presents return on assets of sheep and beef farms from two sources, PRONADEGA and FUCREA.

Table 17: Return on Assets

	PRONADEGA	FUCREA		
97/98	6.6			
98/99	1.1			
99/00	1.6	Inf. 25%	Average	Sup. 25%
00/01	3.1	0	3.3	7.0
01/02	-	0.3	2.7	6.0

[49] OPYPA estimates the costs, and income of an average farm, considering and following a governmental act. This information provided by OPYPA is official and was used until July 1995 to pay IMAGRO tax. Since the information published by OPYPA is an official source and calculated with the same method all the years constitute a good source of information for the average situation in Uruguay.

[50] FUCREA is a private association of farmers, who share technological assistance and collect the information for economical analysis. The information gathered is published once a year to the public. All the information is processed with the same criteria. They are not representative groups in the country since generally CREA farmers perform above the average farmers, however, they constitutes a good source of information (Fucrea Jornadas de Intercambio Economico en ganaderia, 1198,1999,2000,2001,2002).

[51] PRONADEGA was an aid program founded with international money and carried out by the MGAP with the objective of increasing the managerial ability of medium size farm managers. During the program was developed information was collected annually and the cost of beef production is presented in table 17.

5.3.3.2 - An Overview of the Processing Sector

The following sections present the relevant information regarding the strategies, structure and level of rivalry among the processing plants. It starts by introducing the structure of the processing sector, including the ownership system and number of plants. Then, the slaughter in Uruguay and the infrastructure available for the cattle kill are presented. Following this, there is a description of the marketing strategies, cattle purchase and cattle traceability of the processing companies. Finally, the level of rivalry in this sector is analysed.

5.3.3.2.1 - The Structure of the Processing Sector

Ninety five percent [52] of cattle slaughter in Uruguay is carried out in 38 licensed processing plants. For the 38 firms, cattle slaughter has always been the most important activity because of the low level of sheep slaughtered in Uruguay. Within these 38 firms, 25 are licensed for the international market and the rest (13 plants) only for the domestic market (INAC, 2002). The 75% of slaughterhouses licensed for the international market are located in the area surrounding Montevideo (Vilanova & Patrone, 2002). The number of plants varies, because the closures of plants due to bankruptcies are common among processing plants in Uruguay. Several closed plants have re-opened, after a while, under different ownership. The 25 abattoirs with a licence to export are divided in two classes. One class includes the abattoirs that are licensed to export to the EU and the US markets[53] (17 plants). The other class are the processing plants that are licensed to export to other less strict markets (such as Israel, MERCOSUR countries and others) (8 plants) (INAC, 2002).

Apart from these 38 licensed plants there are 39 local abattoirs (Class II[54] and Class III[55]), which can sell the meat in the areas where they are located. There are four abattoirs in class II and 35 abattoirs in Class III (INAC, 2002). These categories appeared after the regulation changes in 1985 because not all the small plants could financially comply with

[52] The rest 5%is killed on farms and on other local facilities.

[53] Class II have a slaughter capacity of no more than 30 cattle and they are located in towns or villages where there are no abattoirs licensed at a national level. They have a maximum radio of distribution of 40 km if, in this area, there is no other abattoir at a national level These four abattoirs have a slaughter capacity of 52 cattle, 78 sheep and 30 pigs.

[54] Class III abattoirs have a slaughter capacity of no more than three cattle and nine sheep. They have to be in a town or village where there are no abattoirs of a superior level (national level or class II). They can have a maximum radio of distribution to the village where they are located if, in this village, there are no other abattoirs of superior level distributing.

[55] It also includes Japan, which has the same requirement than these other markets.

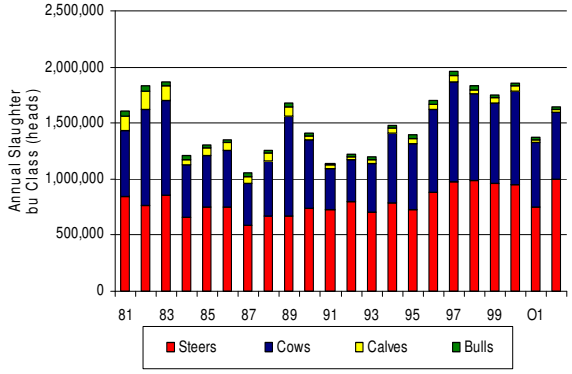
the specified requirements and they were needed to supply remote areas where no bigger plants were located (Vilanova & Patrone, 2002).

There is only one co-operative and most of the processing companies are owned by Uruguayans. However, some external investors have been attracted to the sector over the past ten years. Argentinean investors own Establecimientos Colonia S.A., and also Argentinean investors partially own Frigorifico San Jacinto (50/50 Argentinian /Uruguayan capital). There are also investors from Chile (Frigorifico Monets) and from the US (Frigorifico Canelones). Most of the processing companies own only one plant, with the exception of a group of investors who owns three plants, although these plants are managed independently (Vega, 2001, Ordeix, 2000).

5.3.3.2.2 - Slaughter in Uruguay

In 2002 1,642 thousand cattle[56] were killed (INAC, 2002). Steers and cows constitute the most important part of the slaughter, accounting for more than 96-98% of the slaughter, the rest are bulls and calves. Sheep meat has always been a secondary business for Uruguay, in 2002, 807, 500 sheep were killed in licensed processing plants. Although dairy cattle (mainly cull cows) are killed, they do not constitute an important proportion of the slaughter (INAC, 2002; DICOSE, 2002). Figure 19 shows beef cattle slaughtered by class.

Figure 19: Annual Slaughter by Class



Source: INAC, 2002

The average live weight of the animals sent to slaughter is around 455-460 kg, being lower for cows than for steers. However, the slaughter weight also depends on the market

[56] Animals killed in licensed processing plants so it does not include either local supply plants or farm slaughtering

for the Hilton quota, for which the animal are required to be beef breed steers and weighing 460 kg, since the cuts sent to the markets need to be of certain size. Table 18 presents the weight and dressing percentage for the year 2001.

Table 18: Weight at Slaughter

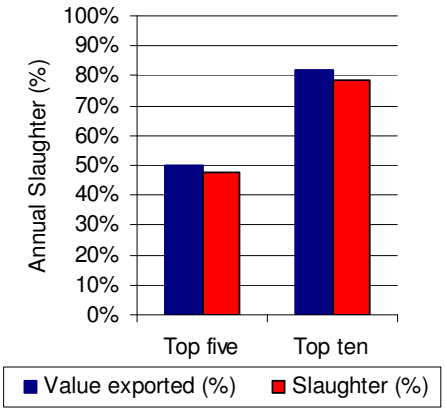
	Live Kg	Dressed Kg	Dressing %
Average	456	240.1	52.62
Cows	418.9	210.6	50.28
Steers	487.1	263.6	54.13

Source:INAC, 2001

5.3.3.2.3 - Slaughter Infrastructure

Slaughter and exports are concentrated in a few plants. Seventy eight percent of the licensed slaughter is concentrated in 10 abattoirs, which also export 83% of the beef exported in the country. These plants are licensed for the strictest international markets (the EU, the US and Japan) (INAC, 2002). Figure 20 shows the percentage of the annual slaughter and value exported by the top ten and top five abattoirs.

Figure 20: Slaughter and Value Exported (%)



Source: INAC, 2002

In all the categories the slaughter capacity is more than enough for the level of killing in the country. The average surplus capacity[57] of the plants is 50-55%, however, this situation is different for each different type of plant. Considering the 11 abattoirs licensed exclusively for the domestic market, only two intensively use their killing capacity. However, considering the export abattoirs, they use 81% of their slaughter capacity. So there is an important asymmetry in the surplus capacity among the different processors (Vilanova & Patrone, 2002). In general, the abattoirs in Uruguay work one shift of

[57] Relationship between the slaughter infrastructure available and the number of animals slaughtered

slaughter (8 hours) and two shifts (8 hours) of deboning. Table 20 describes the daily and annual slaughter considering plants licensed to different markets.

Table 19: Maximum Cattle Slaughter per Type of Plant

	Number of plants	Cattle killed /day[58] (Heads / day)	Annual Slaughter [59] (Heads	Cattle per day[60] (Heads/ day) Bigger	Smaller	Debonning carcass /day (8 hours Shift)
Export Plants	**25**	**8,758**	**2,500,000**			**5,385**
EU & US licensed	17	7,270	2,200,000	785	230	4,610
Other markets	8	1,488	400,000	320	88	775
Domestic Market Plants	**13**	**975**	**292,500**	**240**	**20**	**25**
Only deboning						375
Total Plants	**38**	**-**	**2,792,500**			**5,785**

Source: (Vilanova & Patrone, 2002)

Table 19: Slaughter Capacity and Surplus Level

Potential slaughter (PS) [61] (Cattle / year)	Number of plants	% Slaughter / Total slaughter (average 996 2000)	%Slaughter / plant	Surplus capacity 996-2000	1990-1995
> 120,000 (A)	9	65	7.2	20	53
90,000 <PS[62]< 120,000 (B)	6	18	3.0	38	52
60,000 <PS<90,000(C)	7	10	1.4	52	43
< 60,000(D)	16	6	0.4	79	74
	38				

Source: Vilanova & Patrone, 2002

In the plants with higher capacity for slaughtering, when the slaughter level increases they increase their level of operation because they capture a higher proportion of the slaughter. From 1990 to 2000 there has been an upward trend in the percentage of the slaughter captured by the slaughterhouses with the higher production capacity. That is, when the slaughter increases the bigger plants capture a larger proportion of this slaughter. For the nine plants with a slaughter capacity > 120.000 cattle per year, the % of slaughter they carried out in relation to the total slaughter of the country increased from 40% to 70% over the 1990-2000 period (Vilanova & Patrone, 2002).

[58] The slaughter capacity was calculated considering one 8 hour shift

[59] Estimated considering 285 days working per year

[60] Cattle slaughter capacity of the bigger and smaller plants within this class.

[61] Maximum slaughter that can be done in a year

[62] Potential Slaughter

Table 20: Percentage of Slaughter by Type of Plant

% Slaughter	> 120,000	90,000<PS<120,000	60,000<PS<90,000	<60,000
1990	42	11	17	6
2000	70	16	9	6

Source: Vilanova & Patrone, 2002

In the last decade there has been important improvements in plant infrastructure and technology, which have allowed the industry to improve its efficiency (Vilanova & Patrone, 2002; Ordeix, 2001). Previous studies carried out in the processing sector in Uruguay have identified that some of the main strengths of the processing pants have been the adequate size of the bigger processing plants, according to international standards and the good technological level in the plants licensed for the most strict markets (COMISEC, 1995).

During the interviews with the managers of the processing plants, they were asked about any factors related to the level of technology or infrastructure in the plants that could be limiting the efficiency or quality of the product obtained. All of them agreed that the level of technology and infrastructure were adequate to efficiently obtain a good quality product. They emphasise that the level of technology and infrastructure in the export slaughterhouses (which were the ones interviewed) are in accord with international standards, since they have imported technology from overseas (mainly from the US, Australia and Europe and, to a lesser extent, from New Zealand). Some of them stated that the cool store is a limiting factor in some plants and this capacity has always been expensive to increase. Studies developed by INAC in relation to the chilling and freezing capacity of the abattoir shows also some deficiencies in several plants (INAC, 1990; Vilanova & Patrone, 2002).

5.3.3.2.4 - Cattle Purchase Strategies

Most of the cattle transactions are carried out with middlemen. Generally, farmers pay these intermediaries, who are independent of the processing plants. To a lesser extent these middleman are hired by the processing companies, or they have a close relationship with them, and they take the cattle to the company. Because of the production system in Uruguay the number of transactions are high. Cattle are traded from the breeding farms,

to the finishing farms and often the cattle pass through one or several rearing farmers before the final fattening stage (Hugo Revello, personal communications, 26 November, 2002)

Payment is usually on a carcass weight basis but there are also several abattoirs that pay farmers on a live weight basis. In relation to the factors that are relevant when purchasing cattle, the managers interviewed stated that weight, sex and age are the most important. Also, the grade provided by INAC (which considers these factors as well), is commonly used. In the biggest plants more objective measures of carcass composition and fat content are being used depending on the market where the beef go. When cattle are destined to markets with narrow specification such as the Hilton Quota market the requirements for cattle purchasing are more specific since animals need to have certain size and weight for obtaining the appropriate size and weight of the cuts sent to the Hilton market. Breeding is not a very important characteristic but non- beef cattle (Dairy Cattle) are always paid below beef breeds such as Hereford and Angus

The relationship between farmers and processors has been very difficult in Uruguay. According to the managers, from the processing companies interviewed, developing long term relationships with farmers is difficult because farmers do not have a chain vision. The farmers distrust the industry, and have short-term vision.

5.3.3.2.5 - Traceability

The plants visited manage to trace carcasses back until date of slaughter and they have also registered, for each carcass, the group of cattle at which this carcass belongs to, plus the name of the farmers who own the cattle. This is necessary when paying on a carcass yield basis (the payment is according to the average over the whole group of animals). The different cuts are only traced back until date of slaughter. Only for special market segments (ecological beef) are animals individually identified. The plant managers interviewed agree that it is possible to trace back to individual cuts but it would be very expensive since it will slow down the slaughter and deboning processes. Some managers were reluctant to believe that it is really what the consumer wants and they suggested that it was only a non-trade barrier of importing countries.

Uruguay possesses an animal identification system, which has been working for decades, DICOSE (livestock control office). Each farm has a DICOSE number and each year farmers need to declare the number of animals that he/she has. All the movements of animals are also controlled by the documentation required for animal transportation and trade. After the outbreak of FMD the Uruguayan government has moved toward an identification of individual cattle using tags on all the cattle born and it will be controlled at the point of slaughter. However, the results from these changes can not yet be analysed.

5.3.3.2.6 - Marketing Strategies

In most of the markets beef is exported through international and/or Uruguayan brokers. In Europe, Uruguayan beef is usually allocated through European Brokers. In some other markets, there are direct contacts with the buyer. In general, Uruguayan companies do not have off-shore offices for marketing purposes.

Marketing strategies were analysed because the problems for Uruguayan beef accessing high value markets have been largely identified as important (COMISEC, 1995; Vega, 2001). All key informants and processing plant managers interviewed were asked about the market situation for Uruguayan beef. The most common opinion from the interviewees related to the industry is reflected in the following statement:

> *" The main problem in Uruguay is getting good markets. When we had good markets* [from 1996 to 2001 when Uruguay was free of FMD without vaccination] *everything was pulled up. The investment in the primary sector, the investment in the processing plants…. That is a good example that what we need are markets…. If we have markets that pay* [good prices] *we have the infrastructure to produce a high quality product in volume and quality (Guillermo Pigurina, personal communication, 10 December 2002)*[63]

Several aspects of this statement were also commonly pointed out by the managers of the processing plants such as the lack of markets for Uruguayan beef, the good expectations generated by the opening of new markets in 1996, and the feeling that everything is ready

[63] Translation from Spanish

to produce high volume and quality products. The only things that are missing are new and attractive markets.

It was interesting to find out that it was a unanimous opinion, from managers and other key informants, that market access has been the major problem along the beef chain. Other problems, such as the low productivity of the farming phase, or inefficiencies in some of the processing plants were considered to be the consequence of this lack of markets.

Vega (2001), in his study of the Uruguayan beef industry cluster, argued that marketing of beef has not been a priority until now, in the country and for the processing companies. He suggested that marketing of beef has in reality become a combination of promotion and fighting against diseases rather than building a proactive, long-term strategy. During the field study in Uruguay, it could be appreciated that there is no strategy in place to find new and high price markets. Managers were more focussed on the external factors affecting their markets than in being active themselves in finding new opportunities. In general, all the companies have the same markets and marketing channels.

Most of the processors said, during the interview, that they sell and then buy cattle (push – pull system). However, it is a difficult thing to do in the Uruguayan production system, since pasture seasonality affects the slaughter level throughout the year. It is possible for them to sell part of the carcass before buying the animals (mainly related to pre-arranged quotas) but there are still other parts of the carcass that are not known where they are going to be sold when the animal is purchased. As was stated by the managers interviewed, the final performance of the whole carcass depends on the allocation of all the different cuts.

When interviewees in Uruguay were asked about the effectiveness of their marketing strategies, they considered that their strategies were appropriate. They thought that there was nothing else that it could have been done, and that they were customer focussed and market driven. In addition, they made responsible for not getting higher prices and better markets to external factors, such as FMD, regulations in the international markets, and subsidies in the US and EU countries. This attitude and the negative environment for Uruguayan firms have been sources of disadvantage for exporters to compete in the

international arena. The excuses and complains of how bad the situation is has limited the development of the industry.

5.3.3.2.7 - Rivalry Among Processing Companies

The managers interviewed from the six abattoirs agree that there is an important rivalry among the different processors in relation to the purchasing of cattle. This situation is worst when the supply of cattle is low. The abattoirs that are located in the north of the country generally buy animals from the farmers located in these areas. However, the abattoirs located surrounding the capital of the country have a higher level of rivalry for buying cattle. The competition for cattle among the different processing companies has , in some situations, stimulated the development of closer relationships among farmers and processors such as in the processing plants Tacuarembo and San Jacinto.

Another important factor to consider in relation to the rivalry among processing plants is related to the competition from abattoirs located in other MERCOSUR countries. When cattle are exported live to Argentina or Brazil it constitutes another source of demand for cattle competing with the domestic abattoirs. Since 1996, live exports of cattle to MERCOSUR countries (mainly Brazil and Argentina) have been allowed. This has had an important effect on the internal prices of Uruguayan cattle, since the exports of live animals has been another source of competition for cattle for the processing industry. Uruguay exports live cattle to Mexico, Argentina and Brazil, with Argentina being the major market (Argentina, primarily, imports calves for feedlots). In 2000, the total cattle exports to Argentina were of 43,000 animals. The exports to Brazil are small and decreasing over the past years. These markets were stopped when FMD appeared.
Not only cattle are exported but also beef. In general, Uruguay exports to Argentina and Brazil, but the movement can be in both directions. These movements are regulated by the competitiveness of the currencies in each country.

Another factor affecting the rivalry among processing plants, according to the managers interviewed, is the unfair competition among different plants, because the government has assisted, inefficient plants, with soft loans. These plants are only operating because they are profitable, but because of the government financial support.

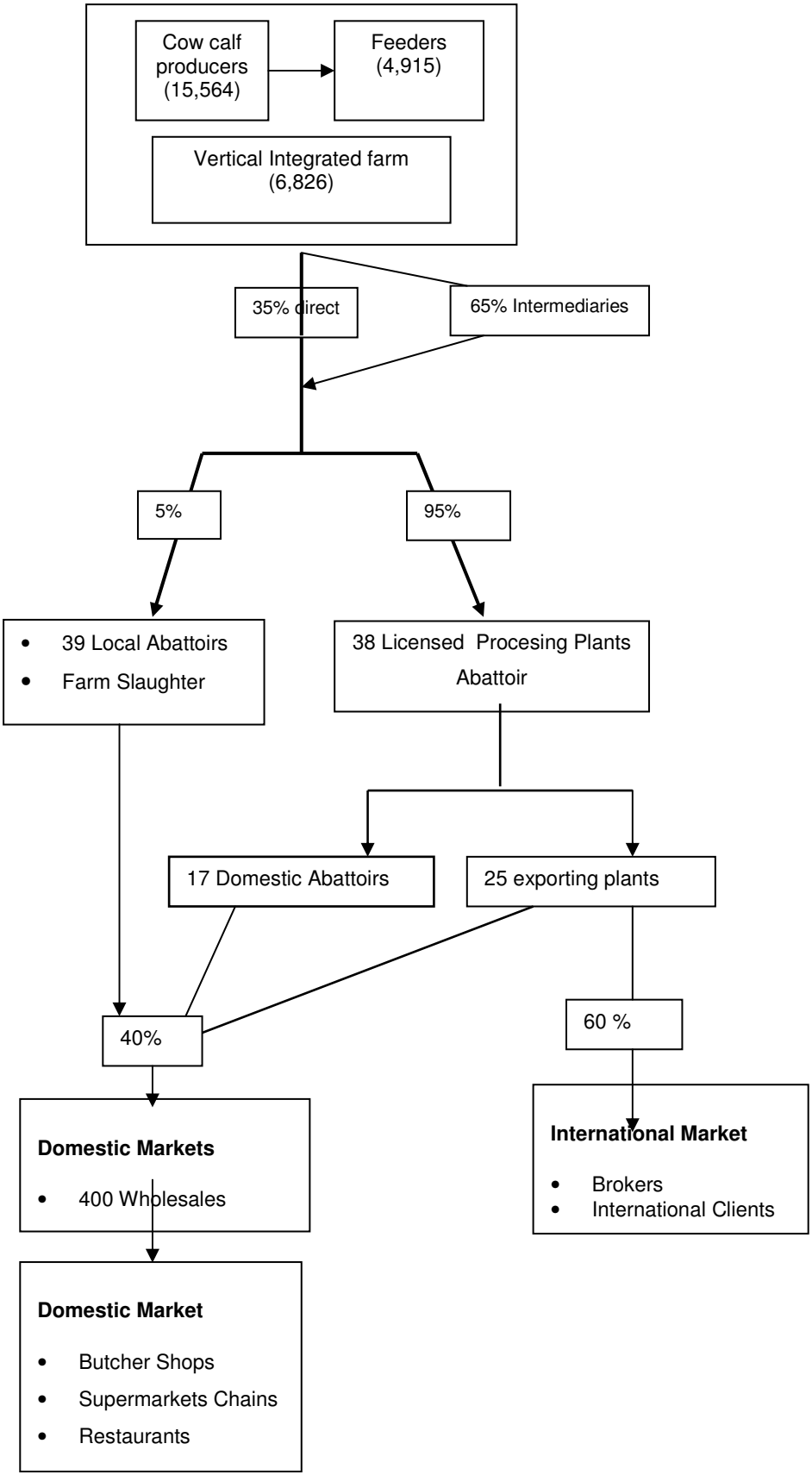
Finally, the managers interviewed also stated that competing in the domestic markets for export abattoirs is difficult, because these companies have higher costs as they have different requirements from the government than any local abattoir. Pigurina agreed that there is a difference in the requirement for an export abattoir and one for the domestic market, but still domestic plants need to accomplish the minimum requirements since, if they do not accomplish them, they cannot open. Small plants receive different prices and they have lower scale of production than an export plant (Guillermo Pigurina, personal communication, 10 December 2002)

During the fieldwork in Uruguay some co-operation strategies were uncovered, for example the study of processing efficiency that 11 of the major exporter plants undertook with INIA. Processors also have participated co-operatively and supported by INAC in activities aiming to develop strategies to increase the Uruguayan market. The managers interviewed stated that co-operation strategies are likely to favour the processing plants in areas such as research, product development and marketing.

5.3.3.2.8 - Structure of the Industry

Figure 21 presents the structure of the beef industry including the main participants of the beef chain. The information was presented during the analysed developed in the previous sections.

Figure 21: Structure of the Uruguayan Beef Industry



5.3.3.3 - Firm Strategy, Structure and Rivalry and Competitive Advantage

Beef production is the most important activity in Uruguay, as can be appreciated in the volume of land occupied by beef cattle and the number of production units. There is an important asymmetry in production and economic performance among farms, but the most common feature, is the low productive performance and low return on assets. The extensive production system of the Uruguayan farms defines that the final product has an inconsistent quality and it is difficult to comply with narrow specifications. Although, in the last decade there have been important improvements in productive performance, which has increased most of the productive indices, farm productivity is still low, compared to production obtained in more intensive production systems available in the country.

Regarding the processing plants, there is an important asymmetry among the different type of abattoirs (licensed to export to all the markets, some markets or the domestic market and the local abattoirs). These differences are related to the surplus capacity (annual slaughter/ potential slaughter), technology in the slaughter and beef processing, plant infrastructure, level of sanitary and hygiene standards. In general, the bigger slaughterhouses have adequate technology and infrastructure to produce quality and efficient products. The six abattoirs visited were similar in relation to marketing strategy, cattle purchasing and level of traceability. Most of the people interviewed were aware of the need to be customer focused, and they knew that several factors are important in order to reach high value markets.

5.3.4 - Related and Supporting Industries

There are no related or supporting industries in Uruguay, which are world leaders. Most of the technology for the processing plants and to a lesser extent in the farming sector is imported from overseas. The dairy industry in Uruguay has been leading the pastoral farming sector in the country with a significant adoption of technology incorporation such as pasture improvement, grazing management, and so on, which has increased total milk production and productivity using less resources (DIEA, 2001). To a certain extent, it has favour the sheep and beef sector in incorporating technology at the farm level, but it does not constitute any significant source of competitive advantage.

5.3.5 - The Role of Government

Although Uruguay has gone through a process of des-regulation and liberalisation, there is still a large influence of the government on the industry. This section presents the main areas where the government is likely to influence the sources of competitive advantage in the industry.

It has been largely identified that the managerial ability of farmers has been a factor, which has constrained the livestock productivity. The government in the year 1998 developed a program PRONADEGA (founded with foreign financial aid) focussed on improving the managerial ability of farmers who owned medium size sheep and beef farms since it was detected as one of the most limiting factor. There were also other organisations such as CEAD, also founded by international aids which had the objective of training farmers and farm consultant in farm management areas (MGAP, 2002).

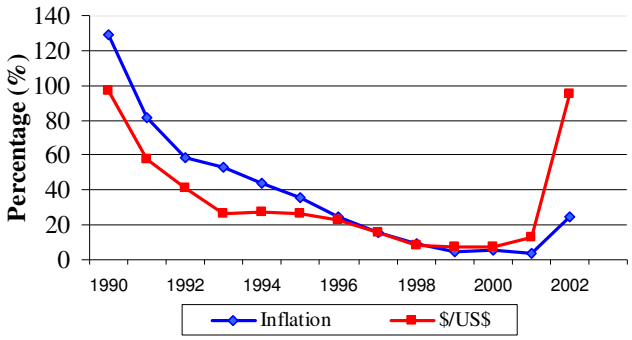
The Ministry of Agriculture is currently undertaking a project called “Proyecto Ganadero” which attempts to solve the problem of closer co-ordination among the participants in the chain. Individual processors with a genuine interest in penetrating quality markets have already demonstrated their interest in co-ordinated some activities with groups of farmers. The government participates with professional assistance and financial support for this integration to occur. The establishment of some market-led producers/abattoir groups, under governmental support, is indicative of such programme (MGAP, 2002).

The government has also had an important effect on the financial system. It has participated regulating the market and passing lows related to the availability of loans for the farming sector. For example after the financial crisis several solutions were took by the government for supporting the farmers affected (Antia, 2002). The government has also participated in the financial assistance of the processing industry, which has distorted severely the competitive relationship among plants. Managers from the processing industry stated that the participation of the government by supporting financially some inefficient plants has affected the competitiveness of the whole industry.

There are also a number of government regulations, which have affected the beef industry. For example cattle is slaughtered at licensed processing plants that meet international hygiene standards guarantee by governmental offices. Sanitary procedures, systems and compliance are regularly reviewed by importing country veterinarians but guarantied by the Ministry of Agriculture. INAC[64] has also an important role in ensuring the product quality consistency and that the product comply with the buyer's specification (MGAP, 2002, Guillermo Pigurina personal Comunication, 10 December, 2002).

Finally, the other factor where the government has had an important affect on the industry is on the effect on the macro-economic variables. For example in Uruguay, for a long time the inflation rate was higher than the devaluation of the internal currency against the US$, so the money received from the exported products worth less in the internal economy. The current government policy's has managed to reduce the inflation rate (4-5%) so this overvaluation of the domestic currency is not happening now. In addition after the devaluation of the domestic currency ($) against the American Dollar (US$), in July 2001, the situation has been favourable for beef exporters. Figure 22 shows the evolution of the inflation rate and the exchange rate against the US$ dollar.

Figure 22: Annual Variation[65] of the Inflation Rate and the Exchange Rate



Source: IE, 2002

[64] The National Meat Institute (INAC) created by law in 1984 is a public organisation non-governmental. The INAC is managed by a board of six people, two government representatives, 2 representatives from the processing companies and 2 farmer's representatives. It is funded by a charge to the abattoirs of 0.6% of the net FOB value on meat products and sub-products exported and 0.7% of the sale meat price of the meat and sub-product destined to the domestic market. Moreover the money that comes from fines, plant licensing and other services to the plants, profit from its assets, and donations that it may receive. The annual budget that INAC has is between 4-7 US$ million which depends on the level of meat commercialised.

[65] Annual variation from December to December

5.3.6 - Chance

Chance refers to situations or factors that do not depend on the characteristics of the country; however, they have an important effect over the determinants of the diamond and they are likely to change the competitive position of the firms. Two factors are presented in this section, FMD outbreak and currency policies in neighbouring countries.

5.3.6.1 - FMD Outbreak

Uruguay is located in an area with FMD and it has vaccinated its livestock for several years. In 1990 it was the last case of FMD in Uruguay and in 1992 a successful vaccination allowed Uruguay to apply for the status of free of FMD with vaccination. In 1994 the vaccination stopped and in 1996 Uruguay is declared free of FMD without vaccination and the doors of the free-FMD markets were opened [66]. Since that moment, farmers guided by the good expectation of the new possible markets, increased investment in pasture improvements and the level of production was expanded.

Uruguay enjoyed its new status not for long. In 2000, an isolated case of FMD appeared in Artigas[67] and the disease was spread around the country in 2001. The first consequence of the outbreak of FMD was the immediate close of all the markets for Uruguayan beef. The government decided to vaccinate the livestock again. In 2001, because of the outbreak of FMD, the slaughter and value exported were 26 % and 42% lower than in 2000, respectively (INAC, 2002).

The outbreak of FMD in April provoked the closure of the markets that were obtained in 1996 such as NAFTA, Japan and Korea. After this period, three abattoirs had a partial authorisation to export cooked and canned meat to the US. In the year 2003, the situation is slowly coming back to normal. United States stops the banning of boneless, frozen and aged beef from Uruguay on May 2003 after the notification of the OIE that declared Uruguay as free of FMD with vaccination. The decision of USA is a consequence of the adequate sanitary measurements taken by Uruguay to Control and eliminate FMD, such as the vaccination programme, livestock movement regulation, border checks, boneless

[66] Before 1996, refrigerated bone-in beef (chilled and frozen) was exported to FMD markets (MERCOSUR). The EU, Israel and Canary Islands (low risk markets) accepted boneless and mature refrigerated beef in order to minimise the risk of contamination with FMD. To the US, (zero risk) Uruguay only exported cooked or canned beef.

[67] This area was isolated and Uruguay could still market its production.

process and inspections. Uruguay is also trying to recover the markets of Mexico, Japan, Korea and the Caribbean countries (La Nacion, 29 May, 2003).

The presence of FMD in the country has been one of the most limiting factors for developing the beef industry. The volume exported is directly related to the status of the country in regards to FMD. It has always prevented the industry to have a more proactive marketing strategy in high value markets, and it has contributed to the bad reputation of Uruguayan beef.

5.3.6.2- Currency Policies in Neighbouring Countries

Argentina's and Brazil's currency movements have significant effects over the Uruguayan beef marketed because it affects the relative value of this product. The amount of beef traded and the directions of trade depend on the relative value of these currencies. The devaluation of Argentina's and Brazil's currencies against the US$ put the industries in Uruguay in a non-competitive position, which ended up with the devaluation of the Uruguayan currency several months later.

5.3.7 - The Determinants as a System

The final analysis of the sources of competitive advantage using Porter's Diamond Framework needs to include the interactions among the four determinants and also the effect of the external factors on them. According to Porter, one corner of the diamond could not be a source of competitive advantage without considering all the interactions. The main source of competitive advantage for the Uruguayan beef industry is its low cost of production based on favourable natural resources and the low cost of some resources such as land and labour. Considering the markets where Uruguay sells most of its production, which is mainly done as a commodity, low cost of production constitutes an important source of competitive advantage.

Another source of competitive advantage, which may help the differentiation of Uruguayan beef, is its natural resources. Adequate soils and climate favour the production of grass-fed beef. In addition, the extensive production systems determine that the level of inputs used in the production process is low. Consumers worldwide have identified this feature as desirable. These attributes have not been extensively exploited.

However, Uruguay, in the last few years, has been trying to introduce into the market the image of “Natural Uruguayan Beef”. Consequently, the advantages mentioned above have been used by the Uruguayan government and the participants of the industry to promote Uruguayan beef and obtain new markets.

The characteristics of the demand for Uruguayan beef, for example the relationship with sophisticated markets such as the EU, have contributed with the upgrading of the industry in order to comply with the requirements of these markets. The periodical controls and inspections from offshore markets are the main stimuli to improve and innovate the processing plants. This improvement can be seen in the higher level of technology and infrastructure present in the exporting plants compared to the domestic market plants. Furthermore, the development of new products has also been related to the international market.

The beef industry in Uruguay also possesses several sources of competitive disadvantage. First, the location of the country with a long border with Brazil and Argentina determines that the control of contagious diseases such as FMD, is very difficult. In addition, it is difficult to obtain and maintain the status of free of FMD if these neighbour countries are not free as well. This means that Uruguay needs to undertake co-operative strategies with these countries in order to fight against these diseases.

Another important source of competitive disadvantage has been the high cost and low availability of capital, which constrains the development of the beef chain. This has been one of the most important factors identified by most of the key informants interviewed. Without capital to invest, the performance improvement of the industry has been severely affected, in both the primary sector and the processing companies.

An additional disadvantage of the beef industry has been the inadequate marketing strategies applied by the beef exporting plants. As a consequence of the sanitary situation in Uruguay, marketing strategies have been focussed on fighting against the disease not having a pro-active strategy. It is clear that this has prevented the Uruguayan exporters to have an aggressive marketing approach, and it has delayed the reach of new markets

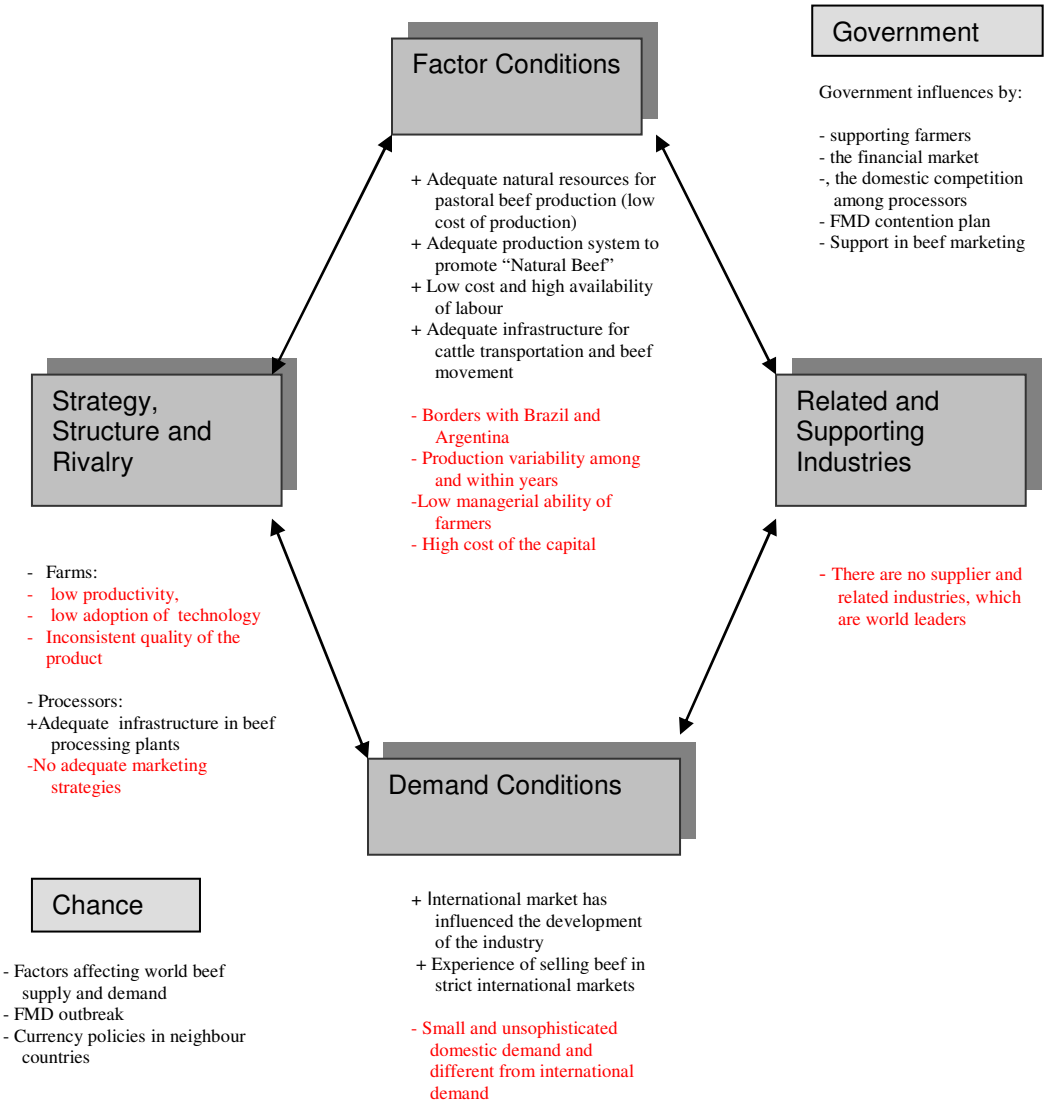
Analysing the Uruguayan beef chain, two steps in this chain were identified as limiting the performance of the primary sector, the market access, and the prices received. The restrictions to obtain good prices in the international market have limited the development of the beef chain since farmers are paid according to the prices received internationally. The low price received by Uruguayan farmers has contributed to the low adoption of technology. Then, the low technology adoption has affected the performance of the industry. This situation is similar to the egg and the chicken, with the question about which problem comes first. Not only the low prices received by farmers restricted the increment in their productivity, but also the low performance of the primary sector determines the low productivity, low exportable volume and inconsistent quality of the product exported by the industry.

Another significant factor identified in the analysis of the sources of competitive advantage of the Uruguayan beef industry was the relevance of the government participation in the industry. Several areas were identified in which the government played a central role. First, the government regulates and controls the financial market. Second, the government's financial assistance to processing plants has generated, in several occasions, disloyal competition among plants. Third, the government supports research and development mainly in the farming sector with governmental programmes aiming to raise the main productive and marketing limitations in this sector. Fourth, the government has also participated in the marketing of beef with financial support and promotion of Uruguayan beef through governmental institutions and programmes. Finally, the government has a central role in quality and safety assurance of the product sold to the domestic and, mainly, to the international consumer.

In summary, the analysis of the results shows that Uruguay has a weaker Diamond for its beef industry. Most corners of the Diamond were found not to be supporting the statements made by Porter about how each determinant should be in order to provide sources of competitive advantage for the industry. Therefore, following Porter's ideas the Uruguayan beef industry would not be competitive and should not be an important industry in the country. However, as was presented previously in this chapter, the beef industry is one of the most important sectors in the country as can be appreciated in the resources used in this industry and its participation in the total value exported by the country. This situation is related to the opportunity cost of the resources destined to the

industry and the sources of competitive advantage for the other industries exsistent in the country. However, these other industries were not analysed in this study.

Figure 23: Diamond for Assessing the Competitive Advantage of Nations



+ Sources of Competitive Advantage

- Sources of Competitive Disadvantage

CHAPTER 6

Case Study 2: The New Zealand Beef Industry

6.1 - Introduction

Chapter 5 presented and analysed the results from case study I *"The Uruguayan Beef Industry"*. This chapter describes and analyses the results from case study II, *"The Beef Industry in New Zealand"*. This chapter follows a similar structure to Chapter 5. It starts with an overview of the New Zealand beef industry's evolution. Then, Porter's Diamond framework is used to analyse the sources of competitive advantage of the industry.

6.2 - Development of the Industry

One of the most remarkable features of the beginning of the meat industry in New Zealand is its early relationship with the British market. Since 1882, when the first refrigerated shipment of sheep and lamb carcasses were exported to England, a continuous trade of sheep-meat has occurred between New Zealand and Europe. In the first ten years, since 1882, more than 17 freezing works were operating, mainly surrounding the export ports, and by 1916 there were more than 30 freezing works (Maughan, 1998).

Despite the meat industry increasing its size, considerably, from the early times to 1950, the type of products and their destination did not change dramatically. During this period, sheep and, in a lower proportion, beef cattle, were grass-fed animals (produced at low cost), slaughtered and processed into frozen carcasses at freezing works owned either by farmers co-operatives or by UK meat importing companies. These carcasses were shipped to the UK, in UK-owned ships, and then sold either in London's Smithfield market or to the many butchers' shops, which were owned by the UK processors who operated in New Zealand. The first shipment of beef, mutton and lamb was sent to Canada and the US in 1926 (Maughan, 1998).

New Zealand beef did not have an important share of the market in Europe as sheep meat did. The New Zealand export beef industry started to develop, mainly in the late 1950s, when a significant market for New Zealand manufacturing beef was developed in North America. The industry was rapidly transformed from exporting bone-in products to export bone-less beef to the North American market (Maughan, 1998).

The government in New Zealand had an important role in the development of its agricultural sector. Mainly, as a consequence of the great depression in 1930, the New Zealand government applied a series of policies to protect the New Zealand economy from the adverse effects of the overseas fluctuations. These policies mainly protected the domestic industries with import controls, using the overseas exchange earnings from the meat, wool and diary industries. In relation to the agricultural sector there was also important support, including the creation of the producer boards[68], the "economic licensing" of processing plants[69], preferential loans, and a strong investment in the development of the rural infrastructure (Maughan, 1998).

The protectionism of the domestic industry by the government reduced the level of domestic rivalry. Consequently, there was an increase in domestic prices. The high domestic prices, associated with the decline of international commodity prices, placed the economic situation of New Zealand in a very difficult position. When the UK entered the EEC (European Economic Community) in 1973, New Zealand lost its privileged market share in England, which further affected this problematic situation (Maughan, 1998).

The New Zealand government continued its protectionist policy, by making payments to the farming and export sectors using extensive overseas borrowing and by setting more and more regulations. In 1978, the New Zealand government introduced the supplementary minimum price scheme to ensure a minimum price, mainly for sheep products. However, in the early 1980s the situation could not be preserved for much longer and, in 1984, the Labour Government introduced important changes. Some of these changes were the reduction of export subsidies (mainly to agriculture), the opening of the domestic sector to international competition, the reduction of the participation of

[68] In 1922 the Meat Board was gathered for the first time in Wellington.

[69]This measure means that for a new plant to be opened, it had to state that there was an economic reason or justification for it. The economic licensing of plants was imposed in 1939, to stabilise the processing industry and worked as a barrier to entering the industry and to produce changes in it.

the government in the whole economy and, particularly, in the financial sector and the exchange rate also was floated. For the meat industry, three main changes were particularly important. First, in 1981, the "economic licensing" of processing plants was eliminated. Then, in 1984, most of the compensatory payments to farmers were removed. Finally, the Employment Contract Acts (1991) freed the labour market by deregulating the bargaining arrangements between employers and employees (Maughan, 1998).

The deregulation period severely affected New Zealand's farmers. There were many farmers put out of business because they had big mortgages since they planned their investments and debt servicing considering the subsidies would be there forever. Farmers had paid high prices for land, and the future returns were not enough to serve their debt. In addition, the free farm consultant service from the government, which farmers used to have, also disappeared in the same period (Mick Calder, personal communication, 19 February, 2003).

At the time of government deregulation the processing plants were outdated, unfriendly to the environment, located in wrong places (mainly close to the export ports), and operating with low productivity of capital and labour. After that time, several changes occurred in the processing sector. Between 1981 and 1996 all of the UK processors left the industry, all the outdated port works were closed and new up-to-date smaller works entered the industry. These new plants were based on shift work (which was allowed by the modifications of the Employment Contract Act). They had higher technology and more appropriate infrastructure (Maughan, 1998).

Along with the evolution of the markets, the farming sector in New Zealand has been developing to become one of the most efficient in the world in relation to pastoral production activities. The aerial top-dressing and the development of the hill country allowed sheep and beef production systems to increase their efficiency (Maughan, 1998), which has compensated the decline in sheep and beef cattle numbers that occurred as a consequence of the increase in dairy farms (MAF, 2002).

6.2.1 - Summary

The New Zealand beef industry become an important export activity in the 1950s when the North American market become an important demand for New Zealand manufactured beef. This situation, which has been maintained until now, has shaped the industry. Nowadays, the North America market absorbs 75% of New Zealand beef exports (MIA, 2002). The pastoral farming activities have increased their efficiency considerably to become one of the most efficient in the world.

6.3 - Analysis of the Sources of Competitive Advantage

The sources of competitive advantage in the New Zealand beef industry will be carried out following a similar structure that was followed for the analysis of the beef industry in Uruguay. The information used in this section was obtained from the secondary sources and the interviews carried out in New Zealand and detailed in Appendices II and IV respectively. As in Chapter 5, this section explains each of the components of the Diamond Framework, considering their effect on the sources of competitive advantage of the industry. Finally, it presents the determinants as a system.

6.3.1 - Factor Conditions

This section presents a description of the factor conditions in New Zealand and their effect on the source of competitive advantage of the industry following the five broad categories proposed by Porter and which were previously explained and followed in Chapter 5.

6.3.1.1- Physical Resources

Similar to Chapter 5, this section describes the physical resources in New Zealand including its size, location, climate, soils and pasture production.

6.3.1.1.1 - General Characteristics of New Zealand

New Zealand is slightly bigger than Uruguay. Its size is 26.8 million hectares and it comprises three main islands (North Island, South Island and Stewart Island) and several off-shore islands (Antipodes Islands, Auckland Islands, Bountry Islands, Campbell Islands, Chatman Islands and the Kermadec Islands). New Zealand is located in the South

Pacific Ocean at about 2,000 km southeast of Australia, between 34° and 47° south latitude. New Zealand is 1,600 km long and at its widest part is 450 km, and it has a coastland of 15,134 km (CIA, 2001).

Figure 24: Map of New Zealand

The climate in New Zealand is temperate with important regional contrasts. A mountain chain extending the length of the country forms a barrier in the path of the prevailing winds. Therefore, it has a major effect on the climate of the different regions and produces much sharper climatic contrasts from west to east than from north to south. Altough no part of the country is more than 130 km from the sea, some inland areas of the South Island have a continental climate with large daily and seasonal variations in temperature (Metservice, 2002).

Mean temperatures at sea level decrease steadily southwards from about 15 °C in the far north to about 10 °C in the south of the South Island. Temperatures also drop, by about 2 °C per 300 m, with altitude. January and February, with approximately the same mean temperature, are warmest months of the year, and July is the coldest. The annual range of mean temperature [70] in Northland and in the western districts of both islands is about 8

[70] Difference between the mean temperature of the warmest and coldest months.

^{o}C. For the rest of the North Island and east coast districts of the South Island is 9 ^{o}C to 10 ^{o}C. Further inland, the annual range exceeds 11 ^{o}C in places and reaches 14 ^{o}C in Central Otago (Metservice, 2002). Table 21 shows the mean temperatures (max and min) for January and July in cities located in different areas of the country.

Table 21: Mean temperature in Celsius (^{o}C)

Location	Mean max (January)	Mean min (January)	Mean max (July)	Mean min (July)
Auckland	23.8	16.4	14.7	8.0
Rotorua	23.0	12.7	12.0	3.1
Wellington	20.3	13.4	11.3	6.2
Christchurch	22.5	12.2	11.3	1.7
Dunedin	18.9	11.5	9.9	3.1
Hokitika	19.3	11.6	11.9	2.8
Queenstown	22.5	10.7	8.1	.1

Source: Metservice, 2002

Excluding the uninhabited mountainous areas, the coldest winter conditions occur in Central Otago, the Mackenzie Plains of inland Canterbury and on the central plateau of the North Island, but even in these areas night temperature lower than –12 ^{o}C are rare. The North Island has a permanent snowfield above 2,500 m on the central plateau, but the snow line rarely descends below 600 m. In the South Island, snow falls on a few days a year in eastern coastal districts where it may lie for some days even at sea level, although in Westland, it does not lie at sea level. In inland Canterbury and Otago, where there are considerable areas of grazing lands above 300 m, snowfalls are heavier and more persistent and have caused serious sheep losses during severe winters. In those areas, however, it is rare for the winter snow to remain below 1000 m for extended periods (Metservice, 2002).

For a large part of the country, rainfall is spread evenly through the year, although its effectiveness in summer is reduced by the loss of soil moisture through evaporation and transpiration. The greatest contrast is found in the north, where the winter has almost twice as much rain as in summer. The distribution of rainfall is mainly determined by the mountains, and the highest rainfalls occur where the mountains are exposed to the direct sweep of the westerly and north-westerly winds. Therefore, rainfall is higher in the west and in the mountains. The eastern areas of the mountains in both islands are drier, mainly in the South Island, where mountains are higher (Metservice, 2002).

The mean annual rainfall ranges from as little as 300 millimetres in a small area of Central Otago to over 8,000 millimetres in the Southern Alps. The average of the whole country is higher, but for the greater part it lies between 600 and 1,500 millimetres. The only areas with average rainfall under 600 millimetres are found in the South Island to the east of the main ranges, and include most of Central and North Otago and South Canterbury. In the North Island, the driest areas are central and southern Hawkes Bay, Wairarapa, and Manawatu, where the average rainfall is 700-1,000 millimetres a year. Over a considerable area of both islands, rainfall exceeds 2,500 millimetres a year (Metservice, 2002).

Table 22: Rainfall in Various Locations

Location	Mean annual (millimetres)
Auckland	1,198
Rotorua	1,411
Wellington	1,246
Christchurch	635
Dunedin	809
Hokitika	2,865
Queenstown	900

Source: Metservice, 2002

The topography in New Zealand is varied and predominately mountainous with some large coastal plains. Fifty percent of the land surface is classified as steep, 20% as moderately hilly and 30% as rolling or flat. More than 75% of the country is more than 200 m above sea level. The highest point in the country is Mount Cook at 3,764 m, in the South Island, and Mount Ruapehu, at 2,797 m, in the North Island. The altitude constitutes an important feature of the New Zealand climatic characterisation since temperatures decreases with altitude. The two main islands of New Zealand are divided by a central mountain chain, which also affects the rainfall pattern. Therefore, topography has an important influence on agriculture production (CIA, 2001).

6.3.1.1.2 - Soils, Natural Grassland and Improved Pastures

Most soils in New Zealand are naturally acid (pH 4.5 -5) and deficient in phosphorus, sulphur and nitrogen and sometimes potassium. Approximately, 2.2 million tonnes of fertilisers are applied annually on 4-5 million ha of farmland. The total pasture production of New Zealand varies accordingly to soil type, regional climatic conditions and management. As an example of the production variability New Zealand pasture may produce between 5,750 kg dry matter /ha /annum in Wairakei (flat site) to 17, 150 kg dry

matter /ha / annum in Dargaville in the North Island. In the South Island annual pasture production is about 5,850 kg dry matter /ha in Winchmore Ashburton Dryland to 16,600 kg dry matter /ha in Mona Bush Invercargill in the South Island. In general for all pasture types New Zealand pastures have an important seasonal production with higher pasture growth rate in spring and summer than in winter (AMAC, 1996).

Regarding cost per hectare for the farmland area in New Zealand some data are presented in Table 23 of some land types similar to the information presented for Uruguay. As can be appreciated in the table and comparing to the information presented in Chapter 5, the cost per ha are higher in New Zealand than in Uruguay.

Table 23: Farm Land Prices

	US$ per ha
Sheep and Beef (Hawkes Bay)	2,187 US$/ha
Sheep and Beef and Forestry (Wairoa / Gisborne)	2,220 US$/ha
Dairying (Waikato)	12,500 US$ /ha

Source: AMAC, 2002

6.3.1.1.3 - Physical Resources and Competitive Advantage

A mayor source of competitive advantage for the New Zealand beef industry is based on its location, since being an isolated island in the Pacific allows New Zealand to market the product as coming from a clean and green country far away from polluted areas. Being an isolated island and far away from big area of pollution, such as Europe, has helped New Zealand to market its beef, at times when consumers were worried about BSE, FMD and other diseases that have affected the industry. According to Brent Rawstrom[71], (personal communication, 11 February 2003), the island paradise image can be exploited as a marketing advantage for New Zealand and this image has helped him to promote his product in a specific segment of the German market.

In addition, this condition allows New Zealand to stay away from the severe diseases that have affected the beef industry word-wide. Because New Zealand is an island it is more

[71] Mr. Brent Rawstrom was interviewed during the fieldwork in New Zealand. The main objective of the interview was to analyse their beef marketing strategy into a special segment of the German market. In the mid 1980's Rosendale's owners identified a target market in Munich, Germany, and started to produce what this high value market required. The beef is sold to Alois Dallmayrs in Munich, German, which is one of the leading delicatessen shops in Europe The point of differentiation of the product they offer is that it comes from a country located far away from Europe, They also guarantee it hormone free, and total adherence to requirements for chemicals and animals remedies.

difficult for any disease to be introduced to the country. The isolation of New Zealand has maintained the country free of diseases such as FMD disease and BSE, which have greatly affected the beef industry in Europe and South America. In addition, the fact that New Zealand has two main islands separated by 22 miles of ocean may allow New Zealand to isolate one island from the other in the unfortunate situation of a FMD outbreak (Mick Calder, personal communication, 19 February, 2003).

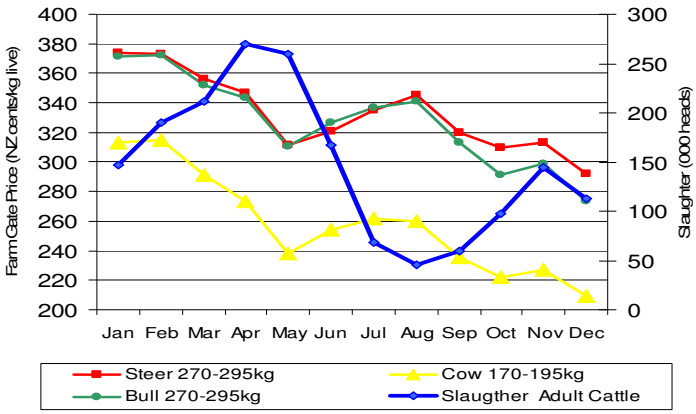
Furthermore, its closeness to the Asian market[72] favours the allocation of New Zealand beef in its growing market, at a lower cost than other beef producers in countries such as South American countries. The Asian markets have a huge potential, not only because of their size, but also because of the possibility of allocating differentiated products at a higher price than New Zealand's current main markets (Neil Taylor; personal communication, 21 February, 2003; Mark Clarkson, personal communication, 17 March, 2003).

Finally, the New Zealand beef industry is also characterised by its pastoral based production system. Pastures constitute 95% of the animal diet. Supplementary feed (hay, silage, or summer crops) is only used in times of fed shortage. New Zealand pastoral production system also constitutes a source of competitive advantage, since it allows the country to produce lean beef at a lower cost than more intense production systems.

Because of the pastoral basis, beef production is highly seasonal, with the main slaughter period occurring from January to July as can be appreciated in figure 25. This slaughter pattern follows the pasture growth curve and, therefore, at certain times of the year processing plants are under-used and price variability within the year is high (Guy, 2000). During summer and autumn, meat companies usually operate near optimal capacity. Conversely, during winter and early spring the cattle supply falls dramatically, forcing processors to pay extra premiums (Sam Robinson, personal communication, 22 February, 2003).

[72] An important aspect of the Asian market, their increasing trend in beef consumption, as was presented in Chapter 4, meanwhile, beef demand in other important markets such as the US and EU are decreasing.

Figure 25: Slaughter (Adult Cattle) and Price in 2002



Source: Agri-Fax, 2003

The reliance on pasture production as the main source of cattle feed affects the performance of the livestock production among years, which also affects prices and cattle availability in the long term. The annual variability of slaughter also affects the product that is available to the market. However, it is less relevant than for the New Zealand situation than for Uruguay because the North American market the quota can be filled over the whole year.

This pastoral production system also constitutes its source of disadvantage because beef production is dominated by the need to use the grass available, rather than producing beef tailored with the requirement of the markets, which can be done in an intensive grain-fed production system. In this production systems it is also difficult to offer the market a continuous supply of a consistent product, which is what high quality markets require. However, these factors do not affect the frozen manufacturing beef sent to North America, which is the main market for New Zealand beef.

6.3.1.2 - Human Resources

The New Zealand population reached four million people in the year 2003 with a growth rate of 1.14% per annum. About 80% of the population live in cities. The work force was 1.9 million people and, in relation to the last information released by NZ Statistics, unemployment reached 4.7% in June 2003 (it was 5.7% in 2001). Literacy, defined as people over 15 years old who can read and write, is 99 % (Statistics New Zealand, 2002).

According to the key informants interviewed, the cost and availability of labour for farming and meat processing activities has became a major problem. The cost of the labour in New Zealand is higher than in Uruguay. Table 24 presents present information about the cost of the labour in the country.

Table 24: Labour Cost

Labour (US$/year)	Cost US$/ Year
Farm Worker	12,000-14,000
Stock Manager	15,000-19,000
Farm Manager	16,000-30,000

Source: Financial Budget Manual, 2002

6.3.1.2.1 - Human Resources in the Primary Sector

In the farming sector, according to the information presented by Meat and Wood Economic Service in New Zealand (MWESNZ) in the sheep and beef farm survey (1999/2000), labour productivity has increased 32% in the last 20 years. Nowadays, it is required 1 labour unit[73] per 2,360 stock units (su) in comparison to 1 labour unit per 1,792 su required in the 1979/1980 year. Following the farm classification presented in the Sheep and Beef Farm Survey, 1999/2000, and considering the "*weighted average all classes*"[74], there is 1.5 labour unit/farm (range from 1.40 to 2.52) and 2,79 labour unit/1000 ha[75].

6.3.1.2.2 - Human Resources in the Processing industries

In regard to the labour in the processing plants, according to the key informants that were interviewed, the availability of semiskilled labour is one of the most limiting factors in the processing industry. They argued that the work in a processing plant is a hard job and most people do not want to work there. They have considered increasing their salaries and they have done that, but this also may compromise the profitability of the plants if it is not followed by an increase in productivity. Interviewees emphasise that the more it could be done to improve the technology and to reduce the requirement for labour, the better. In most of the companies the research carried out for the processing plant includes technology development for reducing labour requirements (Sam Robinson, personal

[73] Defined as 12 months labour input by one person (Sheep and Beef Farm Survey, 99/00)

[74] In the survey there are eight farm types located in both, the North Island and the South Island. The weighted average all classes, represent an average of all these type of farm.

[75] Considering 2,360 su / labour unit and 6.6 su / ha

communication, 22 February, 2003; Mark Clarckson, personal communication, 17 March, 2003).

The changes in the regulations regarding labour in New Zealand had favoured the industry. The interviewees argued that, in the past, there was a centralised union of workers, which generated several conflicts between employees and employers. In contrast, when the Industrial Employment Contract Act was introduced, the situation improved considerably (Sam Robinson, personal communication, 22 February, 2003).

The interviewees were asked about the role of immigrants in solving the problem of the lack of labour in the industry. They were reluctant to believe that it could be a solution. They argued that the processing plants need good and enthusiastic labour, so not just anybody can be employed and also the strictest rules imposed by the government regarding immigration make this alternative even less promising. Therefore, the solution to these constraints is to provide a good work environment, have good relationships with the labour, and also by investing in technology to decrease the labour required (Sam Robinson, personal communication, 22 February, 2003, Mark Clarkson, personal communication, 17 March, 2003).

6.3.1.2.1 - Human Resources and Competitive advantage

The level of education and high productivity of farm labour in New Zealand is the main source of competitive advantage in relation to human resources. The high productive production systems existent in New Zealand and the increase in labour productivity in the last years show this. The cost of labour is considerably higher than was presented for the Uruguayan situation, therefore high productivity compensates it.

In the processing sector the shortage of semiskilled labour is one of the most limiting factors and the problem has been increasing with the improvement of living conditions in New Zealand and the availability of other job opportunities. In contrast, this shortage of labour has stimulated the processing plants to invest strongly in processing plant technology and research, to improve the labour productive efficiency and also to reduce the labour requirements.

6.3.1.3 - Knowledge Resources

New Zealand has always been a leader in the generation of technology for the farming sector, and mainly for the pastoral productions. This can be seen in the export of technology from New Zealand to other countries such as Uruguay, as it was stated in Chapter 5. The competitive dairy industry and sheep meat industry, in which New Zealand is the world leader as the main exporter of sheep meat in the world, are the activities to which most of the research is destined. However, the information generated from it, is widely used by beef cattle farmers.

According to the statement made by the people interviewed from the industry, the research available for the processing companies is less than at available in the primary sector. Generally, each company tries to incorporate the technology available in other countries. People from the plants go overseas searching for technologies to improve the local industry. Therefore, most research is undertaken by each company. However, MIRNZ and now Ag- Research are leading the research in the area. The research from the Universities has also a significant role in generating information for the industry.

6.3.3.1.1 - Knowledge Resources and Competitive Advantage

The level of knowledge available in New Zealand is an important source of competitive advantage in the industry. Although, not much research is destined exclusively to the production, processing and marketing of beef there is enough knowledge generated from the sheep meat, and dairy industries, which has been used by the beef chain's participants.

6.3.1.4 - Capital Resources

All the key informants interviewed were asked about the availability and cost of the capital and they said that neither the availability nor the cost of the capital were a limitation. Most of the capital is provided by private funds and the government does not intervene in the financial sector. According to the information presented by the national bank (2002), the interest rate has been around 7.5% in 2002. Considering the trend in the last decade, there has been an important decrease from 15 % in 1990.

6.3.1.5 - Infrastructure

The New Zealand infrastructure in rural areas is adequate and not limiting for any sector of the beef chain. There are multiple ports and roads in suitable conditions for the movement of the cattle and the products to the market. None of the interviewees mentioned the infrastructure in New Zealand as a problem.

6.3.1.6 - Factor Condition and Competitive Advantage

Table 25 summarises the main aspects related to the factor conditions in New Zealand which are relevant as a source of competitive advantage. The objective is to summarise and clarify the information presented so far. However, the final sources of competitive advantage depend on the interactions among all the components of the diamond. This information is presented at the end of this chapter.

Table 25: Summary Factor Conditions and Competitive Advantage

	Competitive advantage	Competitive disadvantage
Physical resources	• Beef production based on grass – fed systems • High pasture productivity mainly based on RG-WC and Phosphate fertilisers • Being an island favours the control of and reduces the spread of diseases such as FMD • Isolation of the country favours safety of New Zealand products • Good image for being an island in the pacific • Close to the growing Asian market • High variability of production throughout the country	• Variability of production among years depending on climatic conditions • Annual seasonallity of production related to pasture production seasonality. • Production depends on the availability of pastures and not on market requirements (pull system)
Human resources	• Good level of education and managerial ability of farmers • The shortage of labour in the processing plants has been an stimulus for increasing labour productivity and incorporation of higher technology. It has also stimulated the research in this area.	• High cost • Low availability of semiskilled people mainly for the processing industry • Young people do not want to work in the processing plants
Knowledge resources	• New Zealand is a leader in the development of knowledge in farming activities. Knowledge is exported to other countries (such as Argentina and Uruguay)	• Research in the Processing industry is mainly introduced from other countries. Although, the research in the processing industry has been increasing in the last decades
Capital Resources	• Good availability of capital • Low interest rates (particularly in recent years)	• None sources of competitive disadvantage were identified
Infrastructure	• Not limiting, good access to farms, good access to processing plants and enough number of ports situated all over the country	• None sources of competitive disadvantage were identified

6.3.2 - Demand Conditions

This section analyses the characteristics of the domestic and international demand for New Zealand beef as was developed in Chapter 5. The objective of this section is to identify any aspect of the demand, which may affect the sources of competitive advantage of the industry.

6.3.2.1 - Domestic Market

The domestic market in New Zealand is the second largest market for New Zealand beef and account for 20% of the total beef production. It is also the most important market for beef's steak cuts. The domestic market consumes 57% prime cuts and 43% manufactured beef (MAF, 2002).

An important feature to consider is the New Zealand beef and lamb *Quality Mark,* which, represents a set of standards, designed to improve and maintain quality. It was launched to the consumer on 29 September 1997. Meat New Zealand is the owner of the quality mark and the New Zealand beef and lamb Bureau are responsible for implementing the quality mark programme. The quality mark label appears only on meat, which has achieved certain standards, and this label provides assurance to customers that the beef and lamb they purchase has a consistent high quality. It ensures that the beef and lamb under this certificate has met high standards of meat eating quality (tenderness and leanness), presentation information, food safety (microbiological quality), storage and handling and animal welfare.

The key informants interviewed from the processing companies stated that the small domestic market in New Zealand has not stimulated much changes in th industry. However, they suggested that New Zealand's domestic customer is a sophisticated consumer and their concerns about food safety and product quality may help the NZ´s beef industry in improving quality assurance and product traceability that may also satisfy the foreign consumer. In addition, there is an important flow of tourists coming to New Zealand from Europe and Asia, which may influence the products offered into the market.

6.3.2.2 - The International Market for New Zealand Beef

New Zealand exports around 80% of its beef production, (New Zealand Meat, 2002). Prime cuts represent only 21 % of the beef exported and the rest is manufactured beef. For the year ending on September 2002, New Zealand's beef exports totalled 325,943 tonnes product weight (473,000 tones carcass weight equivalent) (MAF, 2002). This volume comprised 307,382 tonnes product weight frozen, and 18,561 tonnes product weight chilled. New Zealand mainly exports boneless beef, which represents 97% of the

volume exported (MIA, 2002). Exports were 900 million US$ and the average price was 1,902 US$/ ton carcass weight.

North America is NZ´s main market. In the year ending in September 2002, by volume, exports of NZ beef to North America were 74% (USA 60% and Canada 14%). Asia is NZ next most important export beef market. The largest market in this region was Japan, followed by Taiwan, South Korea and Malaysia. There are also other small markets such as Oceania, Europe which represent less than 4% of the volume exported (MAF, 2002).

In the New Zealand beef industry there are two types of products to consider, prime beef and manufacturing beef. Prime beef comes from mature cattle in beef herds. Manufacturing beef comes from a variety of sources: the dairy herds, cattle not classified as prime, from bulls, and from the parts of all beef carcasses which are not quality beef. There also calves which are mainly a product of the dairy industry. The unwanted male calves known as bobby calves are sent to slaughter (Maughan, 1998).

The main market for the manufactured beef is grinding beef for burgers and further processed beef. The manufacturing beef, which is 100% frozen, is regulated by a quota system and its price is mainly regulated by the movements of the US stock cycle. Hence, it is more dependent on the US supply than on variation in the demand. The final price that the New Zealand producers receive depends on the exchange rate US$/NZ$. Since the manufactured beef is sold frozen, continuity of supply is not a major factor as it is for the chilled beef market. For New Zealand, the US market is very important because it allocates the beef that comes from the dairy industry's cull cows and bulls. The main requirement for this market is quality and safety, and it has no other tight specifications (Sam Robinson, personal communication, 22 February, 2003).

The other sector of the New Zealand beef is represented by high quality beef cuts which are marketed mainly to North America, Asia and Europe (Maughan, 1998). Around 70 % of the premium cuts are exported to the high-income markets in Japan, EU and the US They are also sold in the domestic market. As prime beef is more market driven than manufactured. According to Mark Clarkson there are more opportunities with prime beef but also it is more difficult to predict therefore it is more risky (Mark Clarkson, personal communication, 17 March, 2003).

Sam Robinson stated that, in the future, the quotas in the US and Canada will not be enough to allocate the product that is coming from the dairy industry. Although Asia is increasing its consumption, its demand is for a different type of product. Therefore, the beef industry could face a problem as a consequence of the mix of products and mix of markets available.

6.3.2.3 - Demand Condition and Competitive Advantage

The characteristics of the domestic demand do not constitute a strong source of competitive advantage. However, the *Quality Mark* label has improved the quality of the product offered into the market. In relation to the international market it contributes with stimulating the processing companies to offer a high quality product but it does not constitute further sources of advantage. For the New Zealand beef industry has been favourable given the production process of New Zealand.

6.3.3 - Firm Strategy, Structure and Rivalry

Following the same structure as Chapter 5, this section describes the beef industry in relation to firm strategy, and structure including, the producers describing the main production systems and their performance, and the processing plants including the number of plants, the rivalry, the processing capacity, the cattle purchasing strategies, and the marketing strategies.

6.3.3.1 - The Primary Sector

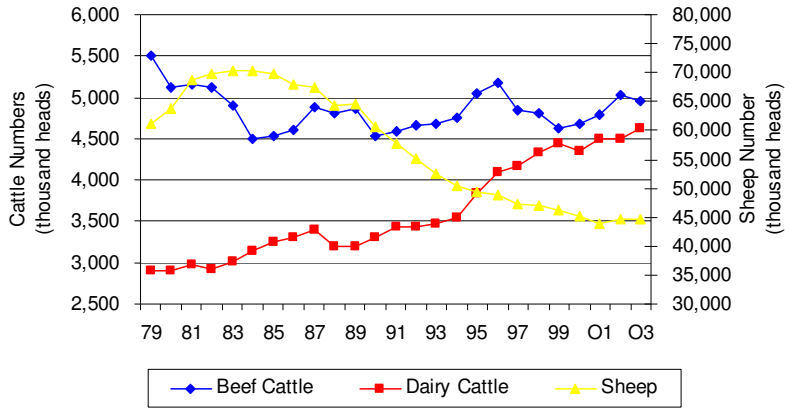
The farming area in New Zealand is 16.6 million hectares and 13.3 million hectares grassland. There are 66,045 farms and 23,776 are sheep and beef farms (MWESNZ, 2000). Very few farmers devote themselves, exclusively, to beef production and the most common situation is farms with sheep and cattle grazing together. Beef production in New Zealand is to a large extent a by-product of milk production. According to Meat NZ, 53% of the cattle slaughtered originate from dairy farms, mainly dairy bobby calves and cull cows (Meat NZ, 2003).

Most of the farms are family farms. Corporate farms are not common and the vertical integration, from the processing industry backward into farming, is also not common.

There are some examples of corporate farms in New Zealand but they are the result of government participation, such as, the Maori Incorporations (Maughan, 1998).

As can be appreciated in Figure 26, in the last decade there have been important changes in the stock composition in New Zealand with the reduction of the sheep stock, and the increment of the dairy stock mainly in the South Island. Several sheep and beef farms have been converted into dairy production due to a higher expected profitability of dairy farms compared to sheep and beef farms (MAF, 2002).

Figure 26: Livestock Evolution (thousand heads)



Source: MAF, 2002

In New Zealand there are three main types of farms to consider in regard to livestock production, finishing sheep/beef farms on the flatter country; breeding sheep/cattle farms on the hill country; and dairy farms, which produce cull dairy cattle for beef and unwanted calves – mainly male – for slaughter as vealers or for raising as bull beef. All these type of farms use pastoral farming systems. Generally, animals are upon pastures based on white clover /ryegrass, with significant addition of phosphate fertilisers (Maughan, 1998).

Breeding cows – mainly located in the hill country- are mated in the period November to January for calves to be born in August-October. These calves are retained for breeding, kept for finishing or sold on to finishing farms. Finishing farms, using a variety of livestock policies raise and finish cattle for replacement or slaughter. Finally, the dairy farms send their culls dairy cows for slaughter and – mainly – into manufacturing beef.

Dairy beef systems – mainly bull beef – may also raise and fatten the unwanted calves from the dairy herds. Farmers operating as margin traders hold and sell the different types of cattle (Maughan, 1998). Table 26 presents some relevant information from 8 types of farms as presented in the sheep and beef farm survey carried out by MWESNZ.

Table 26: Performance Sheep and Beef Farms

	SI High Country	SI Hill Country	NI Hard Hill Country	NI Hill Country	NI Intensive Finishing	SI Finishing Breeding	SI Intensive Finishing	SI Mixed Finishing	Weighted Average all classes
Number of farms	240	860	1,320	4,445	2,205	3,810	2,810	2,485	895
Normal rainfall (mm)	760	772	1,542	1,415	1,171	778	949	706	1,089
Calving Percentage (%)	84.3	84.9	78.6	81.8	83.9	85			82.9
Fertiliser application (kg/ha)	145	205	225	273	316	218	322	349	254
Labour units / farm	2.52	1.83	1.71	1.60	1.42	1.58	1.40	1.93	1.59
Stock unit / labour unit	3,833	2,907	3,063	2,598	1,920	2,434	1,880	893	2,360
Distance to nearest export beef plant (km)	139	97	88	70	50	61	35	48	63
Distance to nearest fertiliser work (km)	254	155	195	155	130	108	74	103	130
Rate of Return[76] (%)	3.3	3.0	2.6	2.4	2.2	2.4	4.0	1.7	2.6
Interest Rate[77]	8.8	8.5	9.2	8.6	8.0	9.0	10.7	8.3	8.8

Source: MWESNZ, 2000

[76] Economic farm surplus as a percentage of total farm capital

[77] Interest rate of new borrowing.

6.3.3.2 - An Overview of the Processing Industry

The following sections present the relevant information regarding the strategies, structure and level of rivalry among the processing plants in New Zealand. It starts by introducing the structure of the processing sector, including the ownership system and number of plants. Then, the level of slaughter in New Zealand and the infrastructure available for the cattle kill, are presented. Following this, there is a description of the marketing strategies, cattle purchase strategies and cattle traceability of the processing companies. Finally, the level of rivalry in this sector is analysed.

6.3.3.2.1 - The Structure of the Processing Sector

According to Meat NZ, there are 18 processing – exporting companies. These companies operate at least one licensed plant, which processes meat for export, and also holds a licence to export meat and, in some cases, these companies exports through mayor subsidiaries. The main processors – exporting companies (considering both lamb and beef) in the South Island are the ALLIANCE GROUP Ltd. and PPCS Ltd., both are farmers' co-operatives. In the North Island, the main companies are RICHMOND Ltd. and the AFFCO GROUP, both are public listed companies (Meat NZ, 2003).

There are eight processors, which are companies that are licensed to process meat for exports, but they do not have an export licence. The products they process must be exported by companies holding export licences. While, these companies can carry out until processing on behalf of a supplier or buyer, in practice, most of the meat they process is on behalf of an exporter, with whom, they have an established relationship (Meat NZ, 2003).

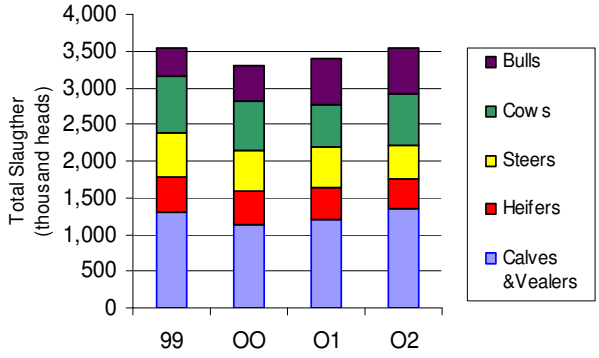
There are also a considerable number of exporters, which are not involved in the slaughter of stock. Some, however, operate their own further-processing / packing business, while many other have strong links with one or more processing companies. Under the Meat Board act 1997, export licensing is an "on demand system", with licenses valid for three years. According to the information published by MeatNZ, in 2003, there are 110 exporters which are licence holders.

In the local market, there are 14 local market processors (12 for beef) who are Quality Mark Holders. To qualify for the QM lavel, participating processors and retailers must meet a range of required standards including tenderness and food safety (Meat NZ, 2003).

6.3.3.2.2 - Slaughter in New Zealand

In the year 2002, 2.19 million adult cattle and 1.33 million bobby calves were slaughtered Steer and heifer represents 45 % of the total beef slaughtered. Cows and bulls account for 55% of the New Zealand total adult kill (MAF, 2002).

Figure 27: Slaughter by Class (thousand heads)



Source: (MAF, 2002)

In the year 2002, the average weight of the animals sent to slaughter, which are destined for the international market, was 293 kg carcass weight. This weight usually is higher in the North Island in comparison to the South Island. In the year 2002 it was 295 kg carcass weight in the North Island and 289 kg carcass weight, in the South Island (Agri-fax, 2003).

6.3.3.2.3 - Slaughter Infrastructure

Most processing companies have plants for killing sheep, beef, or both species in the same plant. There are only one company, which is dedicated exclusively to beef slaughter and has two plants for killing beef cattle (Greenlea Premier Meats Ltd[78]). Generally beef plants have one chain per plant and two shifts of slaughter. Sheep plants, usually, are bigger than beef processing plants, and posses several chains (usually six chains) and higher slaughter capacity to deal with these higher seasonality of sheep slaughter (Meat NZ, 2003). The beef processing plants tend to be smaller than the sheep processing

[78] These plants are Hamilton: one chain, 265 cattle slaughtered each shift (two shifts) Halal certified, USDA and EU licensed, and Marrinsville: one chain 200 heads slaughtered per shifts 2 shifts Halal certified, USDA and EU licensed

plants, and work for more days in the year. A typical beef chain in New Zealand will kill and process 400-500 cattle in an eight –hour shift (and generally working two shifts) (Maughan, 1998).

Sheep plants tend to be heavily concentrated with three companies: AFFCO, Alliance and PPCS, killing 70% of the sheep. In contrast beef killing is less concentrated. There are 27 beef processing plants owned by 12 companies. Richmond, AFFCO, Riverlands and PPCS are the top four beef processing companies in New Zealand and they have 14 of the 27 processing plants licensed for the international market for beef. Plants are spread all over both islands, and they tend to be located where livestock is concentrated. In contrast, in the past, plants were located close to the ports. This change has been the consequence of the transport deregulation policies and the Resource Management Act, since processing plants could not longer been placed close to cities (Maughan, 1998). Table 27 presents information about the main beef processing plants.

Table 27: Main Beef Exporters

Name	Number of beef processing plants	Share of export throughput (%)	Ownership Structure
Richmond	4	31	Public Company (listed 2001)
AFFCO	6	20	Public Company (60% producer ownership) listed 1999
Riverlands	2	8	Private Company (owned by ANZCO)
PPCS	2	7.5	Producer Co-operative

Source: RaboBank, 2001

Richmond[79], is the biggest company in the killing and export of beef. It is a public listed company with 2,200 shareholders and the dominant shareholder is PPCS. They kill 580,000 cattle a year in two big plants that kill 1,000 animals per day and two little plants which kill around 320 heads per day. (Sam Robinson, personal communication, 22 February 2003). The second biggest company in processing and export of beef is AFFCO has a total slaughter capacity (in its six 6 beef plants) of 480,000 adult cattle per year. The slaughter capacity per plant varies between 100,000 cattle per year in the big ones to 20,000 cattle per year in the small one. All the plants are ISO 2002, HACCP approved, USDA and EU licensed and four of them HALAL certified (AFFCONZ, 2000).

[79] Ritchmond is a public 2,200 shareholders, 120 million dollars founds, turn over 1.3 billion and 4,400 employees at the pick season.

6.3.3.2.4 - Cattle Purchasing Strategies

Most of the trading of livestock in New Zealand is done in the spot market with no previous relationship among producers and processors (Martin, 1996). In most of the situations, there are transaction agents either paid on a salary basis by the processing company or independent. According to Sam Robinson, in Richmond Ltd. all the relationships are through agents. Most companies pay premiums to farmers that are part of a "Farm Assurance Programme"[80], and they also pay premiums when farmers belong to a livestock supply programme (Sam Robinson, personal communication, 22 February, 2003).

Most of the companies pay 14 days after slaughter. In contrast, Riverlands pays 7days after slaughter. The processing companies receive the money quite quickly because beef is shipped once a week. Once the product is on the ship, the companies fax the documents, and in return they receive the payment. With manufacturing beef, once the product is on the ship the companies fax the documents to America and receive the payment in two days (American importers pay before they receive the product) (Sam Robinson, personal communication, 22 February, 2003)

As was described by Monteiro (2001), considering the spot market, there are three main marketing systems. One marketing system is on schedule. The stock is sold on an agreed price schedule, where prices are specified according to type of animal, grade and weight range. The schedules are produced by the meat companies at the beginning of each week and are made publicly available. Weekly prices vary according to exchange rate, overseas market demand and production, and domestic issues such as seasonal supply, stock number and processing efficiency. Generally farmers pay the levies and the transport to the abattoirs. (Monteiro, 2001; Sam Robinson, personal communication, 22 February, 2003).

Another, market system in the spot market, is the pool system. It is different from the schedule system because at the point of the slaughter the farmer is paid 90% of the value of the cattle and the other 10% is held until the product is marketed. If the market price is better, at the moment of marketing, the farmer is paid 10% plus pool payment.

[80] Farm Assurance Programmes provide information about how animals have been raised.

Conversely, if the market is worse, producers may not get this 10% at all (Monteiro, 2001).

The third marketing strategy is per head basis, and it is known as paddock sale. Stock is inspected by the buyers on the vendor's property and is sold straight out of the paddock so that the change of ownership takes place on the farm. Prices are generally negotiated in dollars per head live weight. Different from the other two systems, in this strategy all the costs and risks incurred, after the animal goes out the farm, are taken by the processor (Monteiro, 2001).

According to the key informants from the processing plants, when purchasing animals, two factors are mostly considered, weight and grade. Breed is usually not considered during the purchase decision. However, when there are special contracts, such as for Angus or Hereford, breed becomes an important factor.

The relationship between farmers and processors in the beef industry in New Zealand has been conflictive, and farmers are reluctant to enter into formal arrangements with processors (Martin & Shadbolt, 2000). Blanchard (1993) also found that an important percentage of farmers exits the contract after some transactions, because of the disappointment with the conditions of the contract. The main obstacles for the development of closer relationships among producers and processors are the lack of trust, co-operative culture (since farmers are typically individualistic and independent) (Martin & Shadbolt, 2000) and poor information flows (Montes de Oca, 1999).

In the New Zealand beef industry only 10% of the exchange between producers and processors is through formal contractual arrangements (Monteiro, 2001). However, there are some informal arrangements, such as implicit contracts or repeated transactions through the same agent, that despite being discrete relationships can be considered as a certain degree of vertical co-ordination (Wylaars, 1994). Examples of this are AFFCO BEEF PLAN and AFFCO COW POOL (AFFCO, 2002). In Richmond, for example, there is a whole range of relationships. About 80% of their relationships are permanent. They do not have contracts as such but they reward farmers for loyalty (Sam Robinson, personal communication, 22 February, 2003).

Processors need to enter contracts with suppliers to guarantee continuity of supply at a reasonable price, because of the seasonal production and supply fluctuation (Montes de Oca, 1999). In contrast, the main reason for farmers to enter into a contract is to increase profit and to reduce market risk (Blanchard, 1993). There are two main contractual arrangements in New Zealand, namely, marketing contracts and production contracts (Monteiro, 2001).

Marketing contracts are the most common way of vertical co-ordination in the beef industry. They can take several structures. Usually, processors offer several production contracts to producers to guarantee a continuum supply during the year. Contract arrangements offer a modified version of the schedule system plus a bonus payment for in full, on time delivery and livestock traceability. The grading system is usually the same as the one used in normal scheduled transaction (Monteiro, 2001).

Production contracts differ from marketing contracts because the contracting firm participates in production decisions, sometimes assuming production risk. In these types of contracts, the contracting firm usually provides some input, and in some cases it owns the commodity being produced (Monteiro, 2001). The Wrightson-Phoenix Betterbeef programme is a very good example of production contract and includes a seed-stock producer (Rissington Cattle Company), dairy farmers, calf rearers, finishers, a stock and station company (Wrightson) and a beef processing and exporting company (Phoenix Meat Company[81]). In the Wrightson-Phoenix Betterbeef the meat company owns the cattle during all the process so it can control the production process, which helps to have a high and consistent quality. The meat company controls the type of animal introduced in the system by providing to the dairy farmer with genetics. It also controls the raising conditions of the animals. In this way the meat company ensures its supply all year around and also the consistency and quality of the product (Adams & Lagget, 2001).

Mr Mark Clarkson was interviewed, as was mentioned before, in relation to the grain-fed beef market in Japan. Five Star Feedlot[82] is a grain-fed beef feedlot operation located in

[81] 20% Canterbury Meat packers, and 80 % Asian NZ Meat Company a beef processing and exporting company located in the West Coast of the South Island Phoenix Meat has as main markets North America and Asia. The brand is Phoenix. The main products are frozen manufactured beef, frozen and chilled prime beef cuts. The company has two subsidiaries, Phoenix beef limited and Weat Meat New Zealand Ltd.

[82] It was formed in 1989 and is a 50/50 Join Venture between ANZCO (Asian, New Zealand Meat Company of NZ) and Itoham Foods in

Wakanui, east of Ashburton. Therefore, the participants of the chain are: farmers who provide animals for the feedlot, the Feedlot firm, the Meat Company, and the Food Company in Japan. The ownership goes from the feedlot to the Food Company in Japan.

Five star feedlot runs 15,000 steers, which are Angus or Angus crosses obtained from selected breeders, mainly, using bulls known for producing cattle with good marbling. The system needs cattle and grain all the year around so there are contracts with cattle and grain producers to ensure a continuum supply. Farmers supply cattle to Five Star Feedlot by contracts, and animals are purchased on the spot market paying on a weight basis plus the transport to the feedlot and the tuberculosis (TB) test costs. Cattle are brought onto the site aged 15-24 months (425 kg) having been TB tested before the arrival and the guarantee of being growth hormone free. Animals are slaughtered 5-6 months later with 650-700 kg live weight.

6.3.3.2.5 - Traceability

Nowadays traceability of beef is not required for the markets that New Zealand sells to. The level of traceability for lamb has been extensively developed in New Zealand because the European customers demand it. In lamb production, animals are identified using DNA samples (Sam Robinson, personal communication, 22 February, 2003).

6.3.3.2.6 - Marketing Strategies

New Zealand is the main exporter of sheep meat. To promote and market this product, processing companies have located offshore offices in the main markets. For example, AFFCO[83], from the North Island, has several overseas exporters, namely, AFFCO NZ in Canada, NZ lamb Company (NA) Ltd. (which is an exported company owned by Alliance Group, Richmond and ANZCO Food), and AFFCO New Zealand (USA) Inc. There are also overseas exporters in Europe, but mainly for lamb, and in Asia. Another example is Richmond, which has offices in Los Angeles, Singapore, Japan, and Hong Kong (Meat NZ, 2002).

In relation to the marketing of beef, the situation is different. New Zealand has a beef quota in the US, and this quota is distributed by Meat NZ among the different processors.

Japan. Food Inc. of Japan owns 50% of ANZCO Foods Ltd.

[83] (NZ Association (five star beef ltd. and NZ lamb company North America Ltd) has subsidiaries such as CMP and Riverlands Group. Overseas subsidiaries ANZCO Foods (Japan) Ltd. Nz beef Japan Inc

Each processing company has its quota, which can be completed at any time during the year. Therefore, they know how much beef needs to be processed in the whole year. Because 75% of the beef exported is allocated in the US, processing companies have put less emphasis in promoting beef than it has been done in lamb (Sam Robinson, personal communication, 22 February, 2003; Neil Taylor, personal communication, 21 February 2003).

In Europe, the beef Quota is only300 tonnes; therefore, when this quota is distributed among the processing companies, each company obtains only few tonnes of beef quota to fill (Meat NZ, 2002). Table 28 shows the proportion of the quota that each processing company had in the year 2002.

Table 28:Beef Quota in Europe Hold by Each Processing Company

Main Companies	Tonnes NPW (Net product Weight)
AFFCO	58.6
Alliance	22.8
CMP CMP /five star beef	6.5 +12.4
PPCS	32.4
Ritchmond	83.9
Riverlands	19.6
Wilson Hellaby	22.8
Total Beef Quota in EU	300

Source: Meat NZ, 2002

In the future, beef production is not likely to increase because it will depend on the land available; therefore, it will depend on the evolution of sheep and dairy productions. It is possible to have an increment in the grinding beef supply because of the bulls that come from dairy production. However, the possibility of allocating this extra production in the market will depend on obtaining an extra quota in North America, or on obtaining new markets for this product (Brent Rawstrom, personal communication, 11 February, 2003).

Rossendale winery is a family farm owned by Brent and Shirley Rawstrom, which is located in Christchurch, Canterbury. Mr. Rawstrom was interviewed during the fieldwork in New Zealand. The main objective of the interview was to analyse their beef marketing strategy implemented in a special segment of the German market. The specific focus of

the interview was to understand which particular factors of the New Zealand environment affected the development of this strategy.

In the mid 1980's, Rossendale's owners identified a target market in Munich, Germany, and started to produce what this high value market required. The beef is sold to Alois Dallmayrs in Munich, Germany, which is one of the leading delicatessens shops in Europe. The point of differentiation of the product is that it comes from a country located far away from Europe, offering full traceability, guaranteeing hormone free products, and control in the use of chemicals in the production system.

Rossendale sells cattle on scheduled price to Phoenix Meat Company. Phoenix Meat Company kills Rossendale's heifers and steers, and 18% of these animals are sold to Germany. The rest of the animal goes to the grinding beef market. Then, they purchase back from Phoenix the rib eye steaks, tenderloins and striploins, which are then sent to Germany on a regular basis during the year. Since, they raise cattle, then sell it to the company and, finally, buy the required cuts from the same animals again, the origin is completely known and ensured to the consumer. There is one shipment per month, of 350 kg in total, to Munich, which represents 240 heads cattle per year.

According to Brent Rawstrom, some problems were faced when this business was started. The first limitation was to find a processing company willing to kill the animals under the conditions that were required. Another limitation was the difficulty of obtaining an export licence. When this business started, the export licences were only granted to existing exporting companies. After, several debates Meat NZ agreed to grant export licences *"on demand",* and anybody can now obtain an export licence.

6.3.3.2.7 - Rivalry among Processing Companies

With regard to the relationship among processing companies, from the information obtained during the interviews, it was stated that there is a strong competition when purchasing cattle, and there are not much co-operation in the market. Apart from that, the New Zealand environment works without any regulation affecting this free competition among processing companies (Sam Robinson, personal communication, 22 February, 2003; Mark Clarkson, personal communication, 17 March 2003).

6.3.3.3 - Strategy Structure and Rivalry and Competitive Advantage

The primary sector in New Zealand is characterised by having highly productive family farms. The productive efficiency of New Zealand sheep and beef farms is higher than the productive efficiency of the Uruguayan sheep and beef farms. One of the causes of this is the excellent pastoral production system used in New Zealand, which is based on improved pastures (mainly Ryegrass plus White Clover) and fertilizers. This system has been used successfully in New Zealand for several years.

Another important feature of the primary sector in relation to pastoral productions activities (such as sheep, beef and dairy) is the intense competition for farmland. Lately, sheep and beef farms have lost area compared to dairy, which has had periods of higher international prices that have favoured it.

The level of infrastructure for slaughter and beef processing is adequate for the quantity of beef produced in the country. There are asymmetries in the level of infrastructure among exporting companies and between them and domestic plants. The level of rivalry related to the purchasing of cattle is high, and there is little co-operation in marketing activities among processing companies.

6.3.4 - Supporting and Related Industries

New Zealand is successful in a range of pastoral industries such as sheep meat and dairy. These industries are world leaders in relation to the efficiency in the primary phase. The sheep meat industry has also developed a good reputation in relation to quality, safety, and the level of confidence in the product that has favoured the beef industry.

There are several other supporting industries, such as the fencing industry and the animal identification systems, that are internationally successful (Crocombe *et al.*, 1991). The presence of these industries may constitute a source of advantage for the beef industry. In relation to the processing industry, New Zealand has improved considerably and has exported technology to other countries such as Uruguay. However, New Zealand is not a leader in this area (Mick Calder, personal communication, 19 February 2003).).

The outdoor tourism industry in New Zealand, which is advertised worldwide, may also help to sell the clean and green image of New Zealand. This would help the beef industry and the other meat productions in allocating their products in the international market (Brent Rawstrom, personal communication, 11 February 2003).

6.3.5 - The Role of Government

As was stated before, the role of the government influencing the sources of competitive advantage for any industry refers mainly to its effects on the four determinants of the diamond. The information gathered in the interviews in New Zealand showed that the government has little participation in the beef industry. This situation started after the deregulation of the New Zealand agricultural sector in the mid 1980s. According to Mick Calder, the beef industry in New Zealand (and the whole meat industry) is one of the most deregulated in the world, and very little support from the government exists (Mick Calder, personal communication, 19 February, 2003).

There is no participation of the government in the financial market. There is a free-floating exchange rate policy, and little participation on firm strategies. Since March 1985, New Zealand's currency has been floating against other currencies, with its value determined day to day in the financial market (Brash, 2000). The exchange rate has a crucial effect in the beef industry. The high variability of this rate has increased financial and markets risks for NZ beef farmers, processors and exporters. The inflation rate is also another important variable that affects both interest rate and exchange rate. When the inflation rate is expected to be high, the interest rate tends to be higher. The banks increase the interest rate to compensate the lower expected value of the national currency. This higher inflation rate may have opposite effects on the exchange rate. It may lead to a strengthened exchange rate, when this higher interest rate is attractive for foreign investment. In this case, the higher interest rate brings capital into the country, pushing up the exchange rate. Conversely, this higher interest rate can also lead to a weaker exchange rate if investors believe that the high interest rate will decrease investment (Woodford, 2001). Another effect of the inflation rate is the capital gain for the businesses that immobilise high amount of capital in assets, such as cattle farming and beef processors. Lower interest rate leads to lower gains in capital so profitability has to increase through increase in efficiency.

The Meat Board, created in 1922 and named Meat New Zealand since 1998, is funded by a compulsory farmer levy of NZ$ 3.60/animal (and NZ$ 0.20/bobby calf), under the meat Board Act 1997. This organisation has a budget of 20-25 million dollars per year. The main function of Meat New Zealand now is related to on-farm research, trade policy, market access, and to a quota allocation system (allocated among the different processing companies based on its performance) (Meat NZ, 2002).

In relation to further regulations of the industry, it is necessary to fill in an animal status regulation form (by law) that must be provided by all livestock consignments for slaughter. This form has to include the health status of the animals and the treatments they have received. In addition, there are governmental veterinarians inspecting processing plants, which are required by importing markets.

In relation to the export licences, they are nowadays delivered "on demand" so that anybody can ask for an export licence and allocate their meat product internationally. This situation may favour particular entrepreneurs (such as Brent Rawstrom) to start their own businesses of exporting high value beef to a specific market.

The government does not intervene in controlling beef exports. The importing market has its own regulations and, if an exporter does not satisfies them, the product would not enter this market. In addition, MIA (Meat Industry Association[84]) observes the behaviour of the different exporters, and any miss-conduct is published.

Finally, there is a recent issue derived from an action taken by the current government in New Zealand, regarding the rectification of the Kyoto protocol signed by the New Zealand government. This situation has brought a controversy in the farming community in New Zealand and has faced the farmers against the government. Signing the Kyoto protocol implies that New Zealand has compromised itself to reduce the emission of greenhouse gases (mainly methane from ruminants). Therefore, it is necessary to collect money for research for this purpose. Levies to farmers has been proposed to collect 25 million US$. However, it has been argued that this research do not ensure that a way to reduce methane emissions will be found, so it can bring problems and carbon taxes in the future. This controversy has arisen because US and Australia did not sign. According to

Neil Taylor, this situation puts New Zealand farmers in a disadvantageous position because it will be an extra cost that other competing countries will not have.

6.3.6 - The Role of Chance

A Reserve Bank report released in February 2003 stated that a FMD outbreak in New Zealand would be a catastrophe. Twenty thousands jobs could be lost and 10 billion losses from the national GDP. Meat New Zealand has a separate contingency fund of 52 million (110 million dollars adjusted by inflation) to rebuild the confidence in New Zealand meat (beef-lamb) in the market in the event that the outbreak occurs. This is the aim of the fund and not to support farm income (Neil Taylor, personal communication, 21 February 2003).

6.3.7 - The Determinants as a System

The analysis of the sources of competitive advantage of the New Zealand beef industry showed several sources of competitive advantage. One source of competitive advantage are related to the efficient primary production sector based in the knowledge and information generated in other pastoral activities (mainly sheep and dairy productions) and several supplier industries which are world leaders in the generation of farming technologies such as the electric fencing. The high performance of the livestock farmers is based also on the adequate level of education, professionalism and knowledge of the production process of New Zealand sheep and beef farmers. In addition favourable natural resources such as fertile soils and adequate climate for pasture production defines the efficient pastoral production system, which has been recognised world wide.

The location of the country, and the fact that New Zealand is an Island in the pacific has been presented in the previous sections as an advantage for promoting the product, ensure quality and have and prevent the introduction and spread of the most important diseases that have affected the meat sector such as FMD and BSE.

In addition, the considerable quota in the North American market (300,000 tonnes) for allocating manufacturing beef, constitutes the perfect market for the type of product

[84] Meat industry association is

generated from the New Zealand system. This market also allowed New Zealand to allocate frozen products and the quota can be completed at any moment within the year, therefore, problems of production seasonality are less relevant regarding the allocation of the product in the market

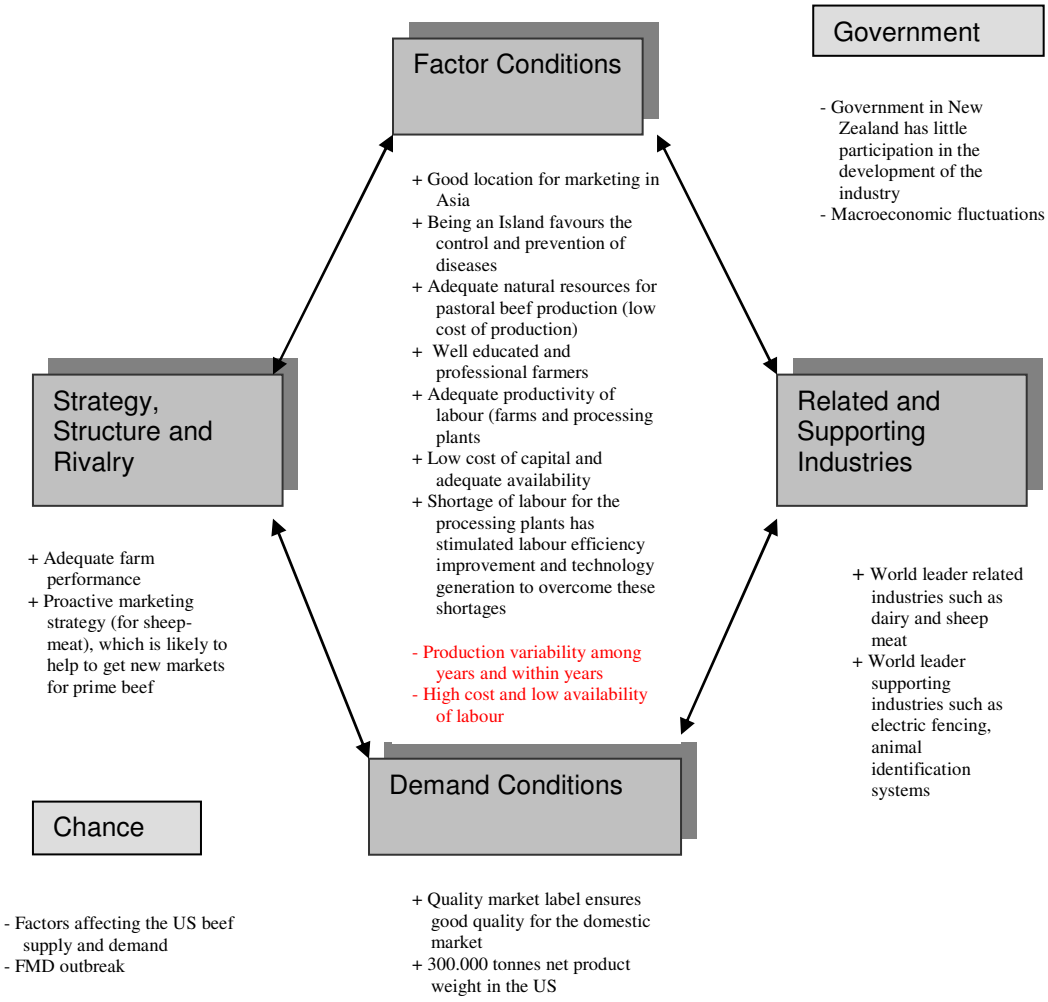
It was stated during the interviews that the competition for land and other resource among the pastoral activities (mainly sheep, dairy and beef) has affected the further development of the beef industry in New Zealand. New Zealand is the world leader in lamb production. In addition sheep can also produce wool, which has been anther important product for New Zealand. Lately the dairy industry has also constituted an important activity and an important area has been taken from sheep and beef production into dairy.

> *"We produce beef from farms that can produce sheep or beef so the relationship depends on the profitability of the two industries. Sheep have two products wool and lamb, and the lamb has been quite successful. so the beef industry has not been very developed. in the way it could have been"(* Neil Taylor personal. communication, 21 February. 2003).

In New Zealand, there is a competition for the same resources between beef, dairy and lamb production. Currently, dairy production is enjoying a high profitability period so there have been important sheep and beef farm conversions into dairying. Considering the quota system with Europe, the quota for beef may make be difficult to increase because of the quota given to sheep meat. New Zealand is considered to produce one of the best sheep meat in the world, and has a already high quota for sheep in Europe. Conversely, NZ has a very small quota for beef so New Zealand beef exporters do not bother to get better prime markets.

Figure 28 presents the determinants as a system, where the main sources of competitive advantage or disadvantage are presented.

Figure 28: The Determinants as a System



+ Sources of Competitive Advantage

- Sources of Competitive Disadvantage

CHAPTER 7

Analysis and Discussion

7.1 - Introduction

Chapter 5 and Chapter 6 presented and discussed the results of the analysis of the Uruguayan and New Zealand beef industries. From this analysis the sources of competitive advantage of the industry in each country were presented. The objective of Chapter 7 is to put together the information from the previous chapters, and to compare the sources of competitive advantage in both industries. This chapter contains three sections. Section 7.2 presents a comparison of the general characteristics of the Uruguayan and New Zealand beef industries to identify the main similarities and differences. Following this, Section 7.3 presents the discussion of the results. The last section presents the chapter summary.

7.2 - Industry Comparison

The objective of this section is to present a comparison of the most significant differences and similarities that were identified previously in the study. It starts comparing the farming sector, then, the beef processing, and finally, the markets and prices for both products.

Total beef production in New Zealand is higher than in Uruguay, mainly considering that Uruguay uses more farmland area than New Zealand for this activity. Despite Uruguay having an increase in beef production in the last decade, its level of production is far from the production levels of New Zealand. In the year 2002, in New Zealand 4.5 million beef cattle grazed 1.9 million[85] ha (MAF, 2002). Meanwhile, in Uruguay considering the same year, 11.5 million cattle graze in 10.5 million ha (OPYPA, 2002). However, total beef production in New Zealand was 576,000 tonnes of carcass weight (MAF, 2002) and Uruguay produced 416,000 tonnes of carcass weight (OPYPA, 2002).

[85] Sheep used 4.1 million ha, dairy 2.0 million ha and deer 0.42 million ha; total pastoral used 8.5 million ha.

These differences in production levels between the New Zealand and Uruguayan beef production can be explained by a different production performance at the farm level. This can be appreciated by comparing the historically low birth rate of the Uruguayan breeding stock, which has been 65-70% (OPYPA, 2002) in relation to 85% obtained, on average, in new Zealand beef farms (MWESNZ, 2000). Beef production per hectare is also lower in Uruguay than in New Zealand. In Uruguay, on average, it is 90 kg live weight per ha per year or 46 kg carcass weight per ha per year, in comparison to New Zealand where beef production can be estimated, on average, in 288 kg beef carcass weight per ha (MWESNZ, 2000).

The low performance of the primary sector in Uruguay has been identified as the cause of the low performance of the whole beef chain (COMISEC, 1995). The reasons for the low performance have been the low adoption of technology, which can be appreciated, in the high proportion of natural pastures (93% of the area) and the low use of any type of feed supplementation. Considering the information presented by MWESNZ in the Sheep and Beef Farm Survey (1999-2000), the application of fertiliser per ha, considering the average of all the farms described in the survey, was 133 kg/ha. In most of the sheep and beef farms in Uruguay the use of fertilisers is non-existent (despite having an important deficiency in phosphates in most of the soils mainly in the livestock production areas).

Another factor that contributes to the lower performance of the Uruguayan beef production, in comparison to New Zealand, is the stock composition and the production system used in both countries. Uruguay has a total beef cattle stock of around 11 million head. Within this, the breeding herd was 4.5 million heads and the steers, which represent the main slaughtered class, were only 2.5 million heads (DICOSE, 2002). This is the reason for which, despite having a beef herd of this size, slaughter was only 1.64 million heads, which represented 14,7% of the total herd. In New Zealand, since the dairy industry provides more than 50 % of the slaughtered animals, having a beef cattle stock of 4.9 million head, the slaughter in the year 2002 was 2,19 million head and 1,33 million bobby calves (MAF, 2002).

The analysis of the beef-processing sector shows that both countries have important similarities. First, both countries possess adequate infrastructure for the slaughter and

processing of beef, required per year. Second, there is an important surplus capacity in the plants and an uneven level of slaughter throughout the year, which is a consequence of the pastoral production system in both countries. This factor determines problems in the level of utilisation of the plants. Third, there is significant asymmetry in the domestic and export plants, which was found to be more critical in Uruguay. Overall, in both countries there are enough and adequate infrastructure for slaughter and processing of beef to comply the requirements for the most strict markets. Despite not comparing costs of production because the information was not collected, they seemed not to be an important factor limiting the competitiveness of the industry in either country.

The analysis of the international context for the beef industry provided some interesting insights, which are shaping the international environment of the industry in both countries. Uruguay and New Zealand need to allocate their product in a highly competitive market, where food safety and health concerns needs to be a priority for the exporters to reach high value markets. In addition, these markets are regulated by sanitary barriers and quota allocation system. Therefore, as well as facing a high competitive environment, they have to face these trade barriers.

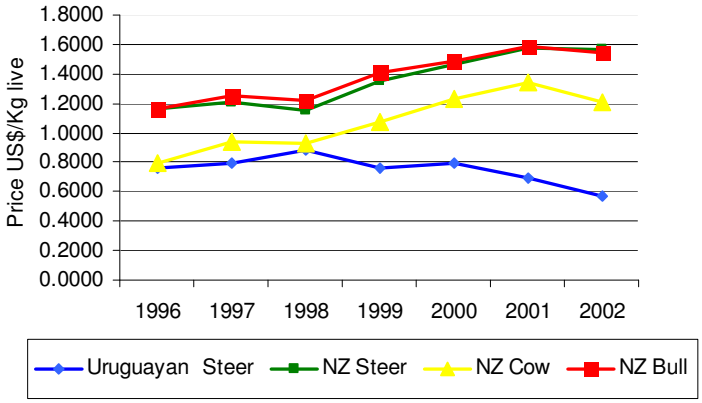
The first step to compare the markets' compositions for both industries is to compare the international price received by the industries. New Zealand beef received an average price of 1,900 US$ per tonne carcass weight, in comparison to 1,042 US$ per tonne carcass weight obtained by Uruguayan beef (INAC, 2002 and MAF, 2002). Considering the same prices in the year 2000, in which Uruguay was free of FMD without vaccination, Uruguay received an average price of 1,344 US$ per tonne carcass weight. These differences in prices received by New Zealand and Uruguayan beef are related to the different market composition for both countries. New Zealand allocates 70% of its exported beef, in the US market. Uruguay has some markets where its beef receives higher prices but most of the exported carcasses have been allocated in lower price markets. In addition, Uruguayan beef has a lower reputation than New Zealand beef so it obtains lower prices for similar products in the same markets.

Therefore, the different prices received depend on the markets that each industry reaches and the prices received in these markets. Considering the international market for both industries, in New Zealand the 70% of the exported product is allocated in the North

American market, being mainly manufactured beef. The rest of the exported beef is allocated in several other markets. In Uruguay, the situation is different and despite the North American market becoming more important for Uruguay, the amount of beef allocated in this market is considerably lower than for New Zealand. Uruguay also has a high value market in the EU under the Hilton Quota but the amount of beef allocated in this market is small in order to have an important effect on the average price. The final composition of the markets for Uruguayan beef determines that many cuts or types of beef are allocated in low value markets such as Africa and/or MERCOSUR countries among others.

Figure 29 compares the farm gate prices received by New Zealand and Uruguayan beef farmers. Uruguayan farmers received lower prices than New Zealand farmers. From the information presented in the study, it could be inferred that the higher price received by New Zealand beef is transferred to farmers, being one of the reasons of this higher price. However, it is likely that there may be other reasons, such as , different payment systems in both countries and the effect of the domestic market.

Figure 29: Farm Gate Price Received by Uruguayan and New Zealand Farmers



Source: INAC, 2002; Agrifax, 2003

From the information presented previously, it can be concluded that there are significant differences in the performance of the primary sector, in the prices received, and in the markets. On the contrary, the processing sectors present considerable similarities in both countries.

7.3 - General Discussion

From the comparison of both industries it is clear that the markets where New Zealand sells its beef and the average price received is an important difference between Uruguay and New Zealand. As was presented before, there are two different markets for beef, manufactured and prime beef. Depending on the market, the strategies that the firms apply are different. In the prime beef markets, products compete based on distinctive attributes such as type of cuts, brands, and product certifications. In the manufactured beef market the only requirements are related to product hygiene, quality and safety.

New Zealand has one of its most significant advantages in its beef quota in the North American market, which is mainly grinding manufacture market. Having a quota of 300,000 tonnes in this market allowed New Zealand to allocate frozen manufacture beef from the type of animals that this country possesses (with a high proportion of dairy animals). In Uruguay, the beef industry is like a dismantling industry where companies buy the animals and then need to allocate each part of the animal in several markets, which have different requirements and specifications. This situation makes very difficult for Uruguayan processing companies to have an adequate market for all the cuts of the animal. Finally, considering other more differentiated markets such as the prime beef market, New Zealand has shown a more pro-active marketing strategy and a better reputation to obtain and maintain new markets.

The analysis of the sources of competitive advantage in both industries shows that they have both similarities and differences. The first similarity is related to favourable climate and soils for pasture production. This factor constitutes the main advantage for the Uruguayan beef industry, which associated to the low cost of some other resources such as labour and land, determines a final low cost for beef production. It is likely, that having a low cost of production has allowed the Uruguayan beef industry to survive despite receiving a lower international price than New Zealand.

In both countries beef production is in the open air and animals are outside all the year around. Therefore, both countries produce grass-fed beef. Beef production based on pasture has certain characteristics such as the production variability between years and the production seasonality related to the seasonal pasture production. The consequences

of those characteristics are an uneven use of the processing plants and a seasonal product offered into the market. This factor is more problematic for Uruguay because of its market composition. On the other hand New Zealand has an important proportion of its beef allocated in the North American market, which is mainly frozen manufacturing beef. As a consequence, the beef quota can be full at any moment in the year.

The cost of some of the resources necessary for beef production is different and not always follows the same pattern in both countries. There is an important difference in the cost of labour and land, being considerably higher in New Zealand than in Uruguay, as was presented in chapters 5 and 6, respectively. Conversely, the cost of capital is considerably higher in Uruguay. The cost of capital is around 12% in US$ in this country. The high cost of capital in Uruguay has restricted the development of the beef chain. In the primary sector, it has restricted the improvement of the productive performance. In the processing industry, it has limited the investment in processing plants and the payment of cattle to farmers, in a shorter term.

In New Zealand, the cost is 6% in New Zealand dollars. The financial system works as a private enterprise where the government does not have any participation. There is a good availability of funds for producers and processors. In New Zealand the allocation of capital is done privately, and it depends on the expected returns of the different investments. In Uruguay, the government has an important participation in the financial market, and it has affected the competition among processing companies

In Uruguay, the availability of labour is not limiting. There are some limitations in the level of education of farmers, who are not well prepared to deal with changes and new technologies. In the processing industry, there is neither limitation in the availability of labour nor in the level of preparation. In New Zealand, farmers are very professionals, and there are no limitations in their educational level. On the other hand, there are problems in the availability of labour, mainly for processing plants. This was identified as one of the most significant problems for the meat processing industry. An increment in salaries could be a solution but this will increase the cost to the industry. Relying on immigrants as a source of labour in New Zealand was not identified as a long-term solution since the government has tightened up the immigration. In New Zealand the shortage of semiskilled labour and its high cost have induced the processing companies to

increase the efficiency of labour, developing new technology to use less labour and using it more efficiently. In contrast, the high availability of labour and its low cost have induced Uruguayan plant managers to rely on more labour instead of increasing labour productivity.

Well-educated and business focussed farmers are a source of competitive advantage in New Zealand. After the government deregulation policy, farmers learned that they needed to be profitable in their business because they would not obtain support from the government anymore. The low support from the government has strengthened the New Zealand farming community. In Uruguay, the higher dependence on the government for solutions has limited the development of the farming activities as a business.

Another important difference between Uruguay and New Zealand is related to the location of both countries. New Zealand location is very appropriate for marketing meat products. Being far away from risky areas such as Europe, it has been very convenient during the BSE and FMD crisis in Europe. Consumers wanted New Zealand meat products (beef and sheep-meat) because of its safety and sanitary status. In relation to FMD control, being an island has made easy to maintain the disease away from the country. The fact that the country has two main islands may also help in the contention of FMD. For example, if FMD appears in one island it can be kept away from the other island.

The location of Uruguay with a big land border with Brazil and a river border with Argentina has been a negative fact in relation to the eradication of FMD. Because this disease is highly contagious, it is very difficult to prevent it from entering the country. Even if an eradication plan in Uruguay is effectively implemented (as it was before 1996 when Uruguay obtained the FMD status), if the whole region is not free of FMD, it will be difficult to maintain this status, as it happened in the year 2002. In an area not free of FMD, it is more difficult to differentiate from the neighbours in relation to the sanitary status.

The higher stage of economic development of New Zealand in comparison to Uruguay is translated into a higher development of basic resources, such as knowledge, human resources, infrastructure, and financial market. All these more developed resources

together provide a better environment for the development of the New Zealand beef industry.

Both countries have small domestic markets; consequently, this does not represent any significant source of competitive advantage in either country. In Uruguay the consumer is less sophisticated and the level of income is lower due mainly to the economical crisis that the country is suffering at the moment. Therefore, the consumption of beef in Uruguay is related to the level of income of the population, as was presented before. In New Zealand, the consumer is more exigent; in addition, there is a higher level of internationalisation of the population because of the high level of immigrants, who bring their customs from different cultures around the world.

As was presented in Chapters 5 and 6, the international demand is important since is the main demand for both countries due to the small size of their domestic markets. Because Uruguay belongs to the MERCOSUR, the size of the regional demand is increased considerably. Despite Uruguay having a small domestic demand, it has a bigger regional demand. However, this regional demand has been unsophisticated and extremely unstable.

In regard to other international markets, they have had an important effect in the development of the processing industry in Uruguay. Most plants have upgraded and innovated their infrastructure to comply with the requirements of international markets. The improvements are related to quality assurance, sanitary level, and in some cases, such as the EU market, product specifications. In New Zealand, the international market is mainly related to North America where the main product is frozen manufactured beef for the hamburger industry. Therefore, there are no high specifications, and the main requirement is related to the quality and safety of the product. In both countries, the government participates controlling the quality of the product offered to the market. In Uruguay, the requirements for selling in the domestic market is lower than the quality control of the products offered internationally.

Uruguay does not have any supplying or related industries which are internationally successful. According to Porter, the presence in the country of a successful supporting or related industry could be a source of competitive advantage. Thus, in Uruguay, this is not

a source of competitive advantage. However, the dairy industry has been one of the most efficient farming activities in Uruguay with a constant increment in productivity in the last 35 years, (DIEA, 2000). The farming technology in relation to pasture improvement, and grazing management has been adapted from dairy production to beef cattle production.

In New Zealand, the presence of internationally competitive related industries constitute an important source of advantage for the beef industry. The industry obtains knowledge from the research generated in dairy and sheep production in the primary sector, and to the sheep meat industry in relation to the processing industry. At the processor level most of the machinery is imported but it is not too sophisticated so it is not a big limitation for the development of the industry. In Uruguay most of the suppliers are foreign for many of the technologies and inputs needed for production. At the processors level, the technology comes mainly from other countries as well.

Comparing firm strategies, structure and rivalry of Uruguay and New Zealand, there are many similarities. First, the farming sector in both countries is based on family farms. Second, in these farms, sheep and beef graze together. Third, the relationship between farmers and processors has been conflictive, and in both countries there are significant rivalry for cattle, an important participation of middleman, and most cattle is sold in the spot market. Third, the pastoral production systems in both countries determine the type of production in both countries. Four, there are many farmers and fewer processing companies. Finally, there are similarities within the processing industries because they have similar size, surplus capacity and level of infrastructure in the processing plants.

There are also some differences. First, the managerial systems in the farming sector are different, and farmers obtain different performances. Second, New Zealand has a pro-active marketing strategy since it has, in most of the main markets, off-shore offices to promote and market their products. In Uruguay, the processing plants are more reliant on the participation of the government, or INAC to do promotion. For example, INAC took the role of promoting Uruguayan beef as natural and certifying the origin of the product as natural beef from Uruguay. This measure has been required because the international consumer knows little about Uruguayan beef, and it is important to start to build a

reputation. In this sense, the participation of the INAC is crucial. However, more aggressive marketing strategies should be put in place by the exporters.

In New Zealand, there are some examples of exporters who have implemented marketing strategies by themselves, such as Brent Rawstrom, Five Star feed-lot which took an active participation in allocating the product. In Uruguay, there have been some attempts to develop niche markets, such as the ecological beef, which sent 12-24 tonnes of beef to Sweden and Italy. However, these strategies have been developed with governmental assistance in some cases.

The fact of New Zealand being a world leader in lamb and sheep-meat helped the development of better reputation in beef. In addition, the clean and green image of New Zealand has been well used. Uruguay is a developing country located in a FMD area, without any other leader known product in the international market. However, in Uruguay the production system is even more natural than in New Zealand, considering the level of fertiliser and external inputs used. However, Uruguay has failed to exploit these characteristics and to use its condition to enter new markets and obtain higher prices.

The presence of FMD in the South cone of South America is one of the main causes of this bad reputation. But even when Uruguay was free of FMD, the situation did not change in relation to prices received. The presence of FMD has been used by Uruguayan exporters as an excuse for low prices and low value markets. The strategies they implement are planned in a situation where the external factors are the most important; however, they do not affect them at all. In front of this situation, nobody could do anything, which end up with a lazy strategy in relation to marketing. In New Zealand, the situation is different. Exporters have learnt a while ago that the fight for the allocation of beef is off-shore and not inside the country. The government does not provide a high level of support, and they know that the only way for any New Zealand firm to succeed is to conquer the international market.

In Uruguay, many participants of the industry are waiting for the markets to improve. Then, if markets improve, everything improves. However, it is likely that the best way is

to be prepared to build up the industry to respond to these markets with volume, quality and any other requirement that they may have, before gaining them.

Similar to OZ (2000), the analysis of the results shows that the government has a higher influence in the sources of competitive advantage in Uruguay, a developing country, than in New Zealand, which is in a higher stage of economic development. In Uruguay, the government has a crucial role in most of the determinants of the diamond; for example, its role in the financial market, in the rivalry among processing companies, farmers support in technology assistance, research and development, general regulations for industry control, and its role in FMD control policy. In most of these situations, the government supports with funds. In contrast, in New Zealand there are few areas where the government participates, and the only situations are limited to home market regulation to ensure quality to the consumer, or processing plant licensing and controls, and some compulsory levies for research.

This different situation has some consequences in relation to the development of competitive advantage. In Uruguay, the supportive role of the government has made farmers and processors dependent on this support, and it has limited their ability to solve problems by themselves and face the competitive forces of the world markets. Both farmers and processors and any other participant in the industry expect the government to respond when there are any problems affecting them. For example, when the financial market crashes the government was expected to respond and help affected farmers. When FMD appeared, the government also had to implement assistance to farmers.

After the deregulation process, New Zealand had little or no dependence on the government. This has helped the country to be prepared to compete in a free market, and New Zealand farmers and processing plant owners know that they need to develop strategies to compete in the international market without much assistance from the government. For example, the fact that the export licences are on demand and anybody can get an export licence shows that New Zealand has established the ground for the appearance of an entrepreneur like Brent Rawstrom who found and develop a niche market by himself.

From the information presented in the previous chapters, it can be concluded that Uruguayan beef industry has a weaker Diamond, compared to the New Zealand beef industry's Diamond. However, the Uruguayan beef industry is stronger in relation to the other industries in this country. Although, these other industries were not analysed in this thesis, some evidence presented in the study showed that factors of production (such as land) has been allocated to beef production and taken away from the other pastoral activities such as sheep and dairy. This shows that beef production in Uruguay constitutes a more profitable alternative in comparison to the other alternatives within the country.

Each country uses its resources in the industries that are more profitable in comparison to the other industries in the country. However, this does not mean that this industry would be internationally competitive. This can be appreciated when this industry is compared with an international counterpart. This situation was demonstrated in this thesis. In New Zealand, the beef industry is less important than the other pastoral activities such as sheep and dairy; however, it was found to have a stronger diamond than Uruguay. Despite the New Zealand diamond being stronger than the Uruguayan Diamond, the beef industry in Uruguay is the most important activity within Uruguay, because it is stronger than the other industries within the country.

In Uruguay, the resources are used in the beef industry because it provides better results than the other alternatives in the country. This is related to the opportunity cost in each country. However, for New Zealand, there are several other alternatives where the resources can be used. Considering the beef industry in isolation from other industries, it seems that there are several problems within the industry in Uruguay. The New Zealand beef industry looks stronger; however, there are other industries within the country that are stronger and use the available resources.

Table 29: Summary of Uruguay & New Zealand Competitive Advantage

Factor Conditions	Uruguay	New Zealand
Physical Resources		
Competitive Advantages	• Low cost of production based on the grass-fed production system • The small size of the country determines that the movement of animals and movement of beef to the ports and domestic market are not major costs • The product obtained through the production system can easily been certified as ecological and take advantage of any market segment that may require this product • Location of the country between Brazil and Argentina opens the opportunity for a regional market of 200,000 million people	• Beef production based on grass-fed system • High pasture productivity mainly based on RG-WC and Phosphate fertilisers • Being an island favours the control of rapidly spread diseases such as FMD • Isolation of the country favours safety of New Zealand products • Good image due to the fact of being an island in the Pacific • Close to the growing Asian market • High variability of production throughout the country
Competitive Disadvantages	• Production depends on the availability of pastures and not on market requirements (pull system) • The borders with Brazil and Argentina make difficult to be free of FMD • Variability of production between years depending on climatic conditions • Annual variability of slaughter defines a seasonal use of the processing industry and variability in the product offered to the market.	• Production depends on the availability of pastures and not on market requirements (pull system) • Variability of production between years depending on climatic conditions • Annual seasonality of production related to pasture production seasonality.
Human Resources		
Competitive Advantages	• Low cost of labour • High availability	• Good level of education and managerial ability of farmers
Competitive Disadvantages	• Level of education and managerial ability of farmers have been a reason for the low production level of the farming sector • Low productivity per hour in the processing industry • Number of owners living on farms has decreased considerably in the last decade, which affects the management of farms.	• High cost • Low availability of semiskilled people mainly for the processing industry
Knowledge Resources		
Competitive Advantages	• The information available is adequate to eliminate the productive constraints in livestock farming. There has been a long history of research in livestock farming in the country.	• New Zealand is a leader in the development of knowledge in farming activities. Knowledge is exported to other countries (such as Argentina and Uruguay) • The research in the processing industry has been increasing in the last decades.
Competitive Disadvantages	• Lack of research in product development in the processing industry • Little marketing research • Information in the processing industry is focussed on export plants	• None

Capital Resources **Competitive Advantages**	• None	• Good availability of capital • Low interest rates (particularly in recent years) • There is considerable farmers' capital in the processing industry with 4 main companies being farmer co-operatives.
Competitive Disadvantages	• High cost of capital • Low availability of capital .	• None
Infrastructure **Competitive Advantages**	• Adequate access to farms and to the processing plants • Adequate infrastructure for allocating the product in the market	• Good access to farms • Good access to processing plants • Enough number of ports situated all over the country
Competitive Disadvantages	• Farm services (electricity, telephone) and community services in rural areas (school, health services) prevent more farmers to live on their farms.	• None

Demand Conditions	**Uruguay**	**New Zealand**
Competitive Advantages	• MERCOSUR opens a market of 200 million people • Experience in selling beef in lucrative markets such as the European Union (Hilton Market) • The Israel market developed the Kosher ritual in most of the export markets. • Brand development in some abattoirs related to the European consumer.	• Quality Mark label developed in the domestic market
Competitive Disadvantages	• Small, unsophisticated and income-level dependent domestic market • Low quality control in the domestic market • Beef demanded in the domestic market is different from the product demanded internationally	• Small domestic market • Low growth rate

Related and Supporting Industries	**Uruguay**	**New Zealand**
Related Industries	• Dairy industry provides good source of technology in the primary sector • There are no related industries that are world leaders	• Dairy Industry, sheep meat and wool industry provides NZ beef industry with technology, image and marketing channels
Supporting Industries	• There are no supporting industries that are world leaders	• Electric fencing technology • Farm technology, seeds, fertilizers

Firm Structure, Strategy and Rivalry	Uruguay	New Zealand
Farmers:		
Competitive Advantages	• None	• Farmers' high performance
Competitive Disadvantages	• Low productivity • Low adoption of technology • Inconsistent product quality • Conflictive relationship with processors	• Conflictive relationship with processors
Processing Companies:		
Competitive Advantages	• Adequate technology and infrastructure in bigger processing plants, which allows Uruguayan beef industry to accomplish the requirements of the most sophisticated markets	• Marketing networks in Europe, America and Asia • Anybody can get an export licence and promote searching for markets
Competitive Disadvantages	• Payment on a carcass base • Low specifications when purchasing cattle • No active actions in the marketing area • Low level of rivalry • Unfair competition because of government participation and different requirements among local and exporting abattoirs • No subsidiaries. Export product are marketed through Uruguayan and international brokers	• Processors competition for cattle

7.4 - Chapter Summary

This chapter presented the comparison between the Uruguayan and New Zealand beef industry, regarding the characteristics of the industry and the sources of competitive advantage. The Uruguayan beef industry has a weaker Diamond in comparison with the New Zealand beef industry's Diamond. Most of the corners of the Diamond do not favour the presence of sources of competitive advantage in the Uruguayan industry. However, the beef industry in this country has been increasing the level of resources allocated to this industry (such as land area). In contrast, in New Zealand, the beef industry has been decreasing its participation and losing competitiveness related to the other pastoral activities such as sheep and dairy productions.

CHAPTER 8

Conclusions and Implications

8.1 - Introduction

Chapter 7 presented the comparison between the sources of competitive advantage in the Uruguayan and New Zealand beef industries, which was the objective of this research. This chapter presents the conclusions, implications and limitations of this study. Section 1 presents a brief summary of the previous chapters. Section 2 draws the conclusions of the study in the context of the research problem being addressed. Section 3 discusses the implications of the results. Sections 4 and 5 present the limitations and the areas that were identified for future research, respectively.

8.2 - Research Summary

Given the similarities and differences of Uruguay and New Zealand, this study aimed to identify and compare the sources of competitive advantage for the firms participating in the beef industries in both countries. Firms obtain competitive advantage when they manage to allocate a low cost product, or a differentiated product, either in the whole market or in a particular segment of the market. The basic assumption behind the objective of this thesis is that when firms in an industry obtain competitive advantage, the industry to which these firms belong, is likely to be internationally competitive. Identifying and comparing the sources of competitive advantage in both industries provided useful information for further studies aiming to investigate how to increase the international competitiveness of both beef industries.

To accomplish the objectives of this research, the first step, which was presented in Chapter 2, was to review the literature in order to find a theoretical framework for the study. The review of literature started by analysing the traditional trade theory from Adam Smith and including several other authors who contributed and improved Smith's theory. These theories explained international industry success and reasons for trade among countries, mainly, based on cost and availability of the countries' factor

endowments, and more recently on product's life cycle, country similarity, and economy of scale. These theories have been widely used since their conception. However, they did not consider the role of firm strategy, which is known to be important in defining the final performance of the industry. Therefore, other theories were investigated, to discern the appropriate theory for this study.

The business management field, which was reviewed next, provided useful insights such as the role of the environment, strategies, and the resources of the firm, in developing competitive advantage. This strand of literature highlighted the factors that are important for firms and chains to obtain competitive advantage. However, by itself, it was not sufficient to look at the research problem because in this approach the question of how firms obtaining competitive advantage can lead to industry competitiveness is missing.

Porter's Diamond Framework was, finally, considered as being the most appropriate theory to approach the research problem. This framework combines the main insights from the traditional trade theory and the business management field to explain how industries could obtain competitive advantage. According to Porter's Framework there are four determinants (factor conditions, demand conditions, related and supporting industries, and firm structure, strategy and rivalry) and two external factors that affect these determinants (chance and government), which shape the industry environment to the benefit or hindrance of a nation's industries.

Since Porter's Diamond framework was selected as the theoretical approach of this research, the main criticisms of the framework were presented at the end of Chapter 3. The main limitations of the framework were related to the theoretical base and methodology, the logic of its arguments, its predictive power, and its applicability. One of the most significant criticisms of the framework, which is particularly important for this research, is related to its applicability in small export-based countries, such as Uruguay and New Zealand. In these situations, several authors have suggested that considering a double diamond or a multiple linked diamond may be likely to explain, more adequately, the competitiveness of the industries within a country.

The aim of Chapter 3 was to describe the research design. First, it presented how the theoretical framework was used to meet the objectives of this research and a description

of the general information that was required to make the theoretical framework operational. Second, a review of the literature on the case study methodology was conducted to gain some insights about the selection of a unit of analysis, data collection methods, and data analysis. The case study literature also provided relevant information such as the importance of using several sources of data to increase the accuracy of the results. Furthermore, it provided useful ideas about the relevancy of different types of interviews to this study and how to conduct them to obtain reliable information. Finally, an organisational framework was presented to identify the main areas to be studied within the industry. The sectors that were identified as relevant in the study were farmers, processing companies, and the domestic and international markets.

This research described and analysed two explanatory case studies: *"The Uruguayan Beef Industry"* and "*The New Zealand Beef Industry"*. For the two case studies, secondary data (statistics, reports and previous studies) were collected, and open-ended interviews to key informants and participants of the industry were conducted. The gathered information was organised following the theoretical and organisational framework in both countries.

The description, analysis and discussion of the results were developed in several stages and presented in chapters 4 to 7. Chapter 4 presented an analysis of the international context for the beef industry. Chapter 5 presented and discussed the results of Case Study I: "*The Uruguayan Beef Industry*. Chapter 6 did the same for Case Study II: "*The New Zealand Beef Industry"*. Finally, Chapter 7 presented the general discussion, where the results from the previous chapter were integrated, and both industries were compared.

Chapter 4 started with the identification of the type of beef markets. The main markets were grouped according to (a) feeding methods (grass-fed or grain-fed beef), (b) types of traded products (e.g. chilled, frozen, prime cuts, grinding, cooked, salted), and (c), sanitary status in relation to FMD. Then, the international beef trade was described, identifying the main producers, exporters and importers. This data showed that international beef trade is increasing. The data, also, showed that most of the countries except from Uruguay, New Zealand, Australia and Canada are mainly focussed on their domestic markets. Therefore, for these countries the international environment extensively affects the performance of the industry. The beef market was also found to be

highly affected by quota systems and regulations in importing countries, mainly in the US and the EU. This situation makes difficult for Uruguay and New Zealand to have free access to these markets.

This chapter also showed that beef demand is decreasing in mature markets (the US and EU are examples of this) but growing in markets such as China, Korea, the Philippines, and Taiwan among other Asian countries. Several factors were identified as affecting the international environment for the beef industry. These factors were related to changes in consumers' lifestyle, health and food safety concerns, animal welfare, and technological changes in production, processing, and marketing of beef. This new environment increases risks but also creates opportunities for the participants of the industry. Consequently, the beef industry in some countries has already changed; for example, by increasing the level of co-ordination along the beef chain, by offering ready to cook beef products, and/or by offering ecological or natural beef products. In summary, Chapter 4 identified the main factors affecting the international environment and also several opportunities that the participants of the industry can take advantage of, if they manage to produce what and how is required.

Chapter 5 presented and discussed the results from the analysis of the Uruguayan beef industry. First, it reviewed the development of the industry in Uruguay, highlighting the relevance that it has had for the Uruguayan economy. During the long history of the industry, three periods were identified as points of change for the industry. One factor was the introduction of the freezing technology in the country. Another change was the deregulation of the industry occurred in the late 1970s. Finally, the improvement in production occurred in the late 1990s was another point of change.

The analysis of the sources of competitive advantage of the beef industry showed that the main sources for the Uruguayan beef industry are determined by its physical resources (fertile soils and mild climate). These resources allow pastures to produce all year around, and, as a consequence, beef can be produced at a low cost and following extensive production systems. In addition, low cost and high availability of labour was also identified as contributing to the low cost of beef production. Furthermore, several factors were identified as limiting the industry:

a) the location of the country to control FMD and other contagious diseases;

b) the managerial ability of farmers; the low adoption of technology at the farm level, which determines low productive performance in the primary sector;
c) the poor marketing strategies implemented by the exporting plant managers, who have been focussed on fighting against diseases instead of having a pro-active marketing strategy;
d) the high cost and low availability of the capital;
e) the small and unsophisticated domestic market; and
f) the lack of any supporting or related industries, which are world leaders and could contribute to develop the industry.

Another important factor identified in the analysis of the Uruguayan beef industry was the significant role of the government in the industry. Several areas where the government affect the beef industry were identified:
a) the participation in the financial market;
b) the financial assistance to processing plants;
c) the support to research and development;
d) the participation in the marketing of cattle and beef products; and
e) the control of product quality and safety assurance for the domestic, and mainly, for the international consumer.

Chapter 6 analysed and discussed the results of the analysis of the New Zealand beef industry. This chapter also started with an analysis of the history of the industry. It then showed that the New Zealand beef industry has always been closely related to the sheep industry in the farming and the processing sectors. The most significant feature regarding the development of the beef industry has been the access to the North American market in the mid-1950s, which continues, until now, being the main market for New Zealand beef. Another important factor identified in the development of the industry has been the deregulation process of the New Zealand economy in the mid-1980s (and of the agricultural sector in particular), which ends a long history of support and subsidies to agriculture. Since that moment, New Zealand farmers have learnt the rules of the free market.

The analysis of the sources of competitive advantage of the New Zealand beef industry showed several sources. First, the location of the country favours the safety assurance

process and also the production of a disease free product. Another source of advantage is based on the efficient primary production sector. This high productivity and efficiency based in the knowledge and information generated in other pastoral activities (mainly sheep and dairy productions) and several supplier industries, which are world leaders in the generation of farming technologies.

Another source of advantage in the New Zealand beef industry is the beef quota of 300,000 tonnes in the North American market. In this market New Zealand allocates manufacturing beef, which has low product specifications and only quality requirements. North America constitutes the perfect market for the type of product generated from the New Zealand beef production system, which uses animals from dairy farms. The US market provides New Zealand with two main advantages. First, all cuts of the animals can be allocated in this market; hence, it is not necessary to find different markets for different cuts. Second, since the quota can be completed at any moment within the year, problems of production seasonality are less relevant in the allocation of the product in the market.

Chapter 7 presented the comparison between the Uruguayan and New Zealand beef industries. This comparison concluded that the Uruguayan primary production sector has a lower productivity and efficiency than New Zealand's. The reasons for this are related to a low use of farming technology available for farmers together with financial restrictions to do so. Another significant difference between both industries is related to the average price received from the international market, and also the market composition that both countries manage to allocate their products. Uruguay allocates an important proportion of its beef in low price markets. The analysis of the processing industry showed that both countries have similar infrastructures, which was found to be adequate for beef processing beef for the international market.

The analysis of the Diamond in both industries showed that the Uruguayan beef industry possesses a weaker diamond than the New Zealand beef industry. In Uruguay, the main sources of competitive advantage are based on the favourable physical resources, which allow for low cost pastoral beef production, and on the low cost of some resources such as labour and land. In New Zealand, having 300,000 tonnes of quota in the North American markets allows the New Zealand beef industry the allocation of an important

proportion of the export volume. In addition, having an efficient farming sector, pro-active marketing strategies, and related and supporting world-leading industries, also contribute to the better performance of the New Zealand beef industry.

8.3 - Research Conclusions

The general objective of this research was to identify and compare the sources of competitive advantage of the Uruguayan and New Zealand beef industry in an international context. The results presented and discussed in chapter 4 to 7 showed that the objectives of this research were accomplished with this study. The main characteristics of the international context for the beef industry were identified in Chapter 4. The sources of competitive advantage in both industries were identified in Chapters 5 and 6, and compared in Chapter 7.

Most of the previous studies using Porter's Diamond Framework have compared industries in the same country. This research by comparing across countries presents a different approach to using the diamond. The Uruguayan / New Zealand diamonds comparison can be seen as a benchmarking exercise that tells something about how both industries could be improved. However, a weaker Diamond in Uruguay relative to New Zealand does not mean that the Uruguayan industry is not competitive within the Uruguayan business environment. Although this research has not studied these others industries in Uruguay, there is empirical evidence, presented in this research, to suggest that the opportunity costs of the factors of production used in the beef industry are low. Hence, it makes sense for Uruguay to persevere with the improvement of its beef industry.

Similarly to Narula (1993), in this study it was clear that the role of the transfer of technology from one country to another is very important, thus not only the technology generated in the country counts. The farming technologies transferred from New Zealand to Uruguay helped to develop the Uruguayan industry without having to develop the technology by itself. The same happens in the processing sector, where both countries import technology from other countries, which are more advanced in this area.

This research agrees with Cartwright (1993) and Rugman & D'Cruz, (1993), who have found that the access to the diamond in other countries (mainly for small economies such as New Zealand and Canada) proved to be as important as the configuration of the diamond in the home base. For example, the international demand for both Uruguay and New Zealand beef are important as it affects the sources of competitive advantage for these industries.

Not only domestic rivalry is important, but also rivalry from international competitors affects the competitive environment of the beef industry. For example, it is clear that the countries of the MERCOSUR, mainly Brazil and Argentina which are important beef producers and exporters, may compete with the Uruguayan processing companies. This competition may be for live animals and/or beef products. In this sense, international competition is as important (Darroch & Litvak, 1992), as national competition (Porter, 1990).

Darroch & Litvak, (1992) have stated that small countries need to focus on international markets and suppliers since the early stage of the development of the industry to reach international success. The information presented in this study shows that Uruguay has overcome some constraints by incorporating technology from overseas. For example, Uruguay has done this in relation to farming technology by incorporating it from New Zealand, Australia, the US and the EU. In this sense, the development of knowledge and technology, within the country, is less important in affecting the competitiveness of the industry, when it is available from overseas and can be easily available.

This research also confirms the findings of Oz (2000) about the more important role of the government in developing countries than in already developed ones. The role of the government is crucial for the Uruguayan beef industry in most of its sectors. In contrast, in New Zealand the industry was found to be less dependent on governmental regulations and support.

Similar to Daly (1993), the effect of the macroeconomic environment was found to be very important for Uruguay and New Zealand beef industry. In New Zealand, the variability of the exchange rate is absolutely relevant for its profitability since once the money is received all the inputs used in the industry are paid in New Zealand Dollars. In

Uruguay the situation is different since most of the inputs are traded in US$ in the country. The exchange rate has an important effect on the competitiveness of Uruguay in relation to the currencies in Brazil and Argentina. If the Uruguayan currency loses competitiveness in relation to these markets, Uruguay cannot allocate much beef in them. There is also an important movement of live animals between these countries (stopped since 2001 because of FMD). If the value of the currencies is adequate, Argentina can be another market for Uruguayan farmers, which distorts the whole livestock market in Uruguay.

Similar to O' Connell, *et al.,* (1999), who highlighted the role of the theory as an investigating tool; the theoretical framework used here was very useful for achieving the research objectives of this research. Porter's diamond framework constituted a useful tool for developing this research and accomplishing the objectives that were previously presented. The main advantage of using this framework was the exhaustive analysis that could be developed in an organised form. However, not all the conclusions obtained by Porter in his study were supported in this research.

The results of this research agree with Oz (2000) since Porter's diamond was found to be a useful framework for analysing sources of competitive advantage and disadvantage in developing countries and for not competitive industry as well for competitive ones. All the components of the diamond including the external factors and the interactions were relevant to explain competitive advantage and disadvantage in Uruguay and in New Zealand. One of the most significant contributions of using Porter's framework for this research was the relevance that firm strategy has in combination to the resources available in the country. It is not enough to have low cost resources if they are not appropriately used or the product is not adequately marketed. In addition, companies not government are in the first line of international competition. Competitive advantage ultimately appears from an effective combination of national circumstances and company strategy. Conditions in a nation may help to obtain competitive advantage but it is up to the firms to seize the opportunities.

8.4 - Implications

At the managerial level, this research is likely to provide both countries with useful information to analyse their current use of the available resources. Therefore, it would help the participants of the beef industry to compare the economic and physical performance ratios at different steps in the chain with an international counterpart. The Uruguayan agriculture has always been compared to the New Zealand agriculture. In several occasions New Zealand has been a reference for Uruguay. However, previous studies have not compared the entire beef chain, as it was done in this study. Hence, this research provides with an exhaustive comparison of the whole beef chain in both countries.

In New Zealand, the evidence presented in this research is useful for developing future strategies for firms in the industry. For example, the comparison of the New Zealand beef industry with a less competitive industry in Uruguay has shown that the main differences between both industries, in defining their different performances, is the market access that New Zealand has for its products and the higher price received. This access is a consequence of the sanitary status and reputation of New Zealand but also of external factors such as quota negotiations. This shows the importance of quota negotiations when thinking about future markets access for the industry.

At the theoretical level, this research provides additional empirical information regarding the applicability of using Porter's Diamond Framework for resource-based industries in developing countries. This research found the framework useful to accomplish the objectives that were addressed. In the theoretical level, this research provides insights about the applicability of this framework in natural resource based industries from small countries, which are in different stages of economic development. In addition, in this research the framework was used to compare industries in different countries, which has not been done previously. This may provide an empirical evidence for further international comparisons and benchmarking studies.

8.5 - Limitations

Several limitations were identified during the development of this study. An important limiting factor of this research was the large amount of data that was required and collected. It was necessary to select the relevant data, which was a time-consuming process. This data was defined in relation to the sources of competitive advantage or disadvantage for both industries. The theoretical framework determined which information to look at, but the final information that was used and presented in the research was defined as the analysis of the data shed light on the findings .

The data available in both countries were not always easy to compare because of the different criteria used and assumptions made, when they were produced or estimated in each country. This difficulty limited the drawing of conclusions during the comparison and contrast of both industries. For example, the final cost of production per kilo of beef could not be compared. Although comparing costs was not the objective of this research, it could have helped support some of the conclusions.

There was an imbalance of gathered information in both case studies. In Uruguay, a higher number of interviews were conducted and more plants were visited than in New Zealand. The reason for this was that the researcher had more access and contacts in Uruguay than in New Zealand. In addition, there are several previous studies about the beef industry in New Zealand, which were used to describe the industry.

Another limitation is related to the coherence between the proposed objectives and the final results found. The final findings are focussed on the beef industry in Uruguay, for which a higher level of information was available. In addition, the researcher had different previous knowledge of the industries, being more knowledgeable for the beef industry in Uruguay. Therefore, there was more analysis conducted for the Uruguayan study. Moreover, since the beef industry in New Zealand appears to be more competitive than the Uruguayan industry, the final results were a comparison of the Uruguayan beef industry against the New Zealand industry. However, the objectives of this study were proposed as a comparison.

Finally, another major limitation of this study was the need for translating the Uruguayan information from Spanish into English. This process was extremely time-consuming but was difficult to predict when the research proposal was elaborated. In addition, in some cases, it was difficult to express in English some specific or technical Spanish terms.

8.6 - Areas for Future Research

The possibilities for future research in this area are numerous. More work needs to be done to analyse the effects of the international markets in both industries. As a consequence of the scope of the study, which was focussed on the home country, the effect of other countries in the final performance and competitiveness of both industries were not completely developed.

Furthermore, there is a need for research in terms of the beef markets. Given the fact that one of the main differences between both industries was related to the prices and volumes that both industries manage to obtain in the international markets, further research is needed to identify which are the causes of these differences. Since, both countries are able to produce similar products, the reasons for these differences may provide the Uruguayan industry with further ideas about the strategies that companies could implement to improve market access. In addition, it is important for New Zealand to develop further studies related to the way of access to new markets, if beef production is expected to increase.

In Uruguay, more research is needed to identify strategies for the participants of the industry about how productive limitations in the farming sector could be eliminated or diminished, given the constraints provided by the low access to markets and low prices received. Both ends of the chain were identified as being weaker than in New Zealand. However, it is difficult to invest to increase production without having the markets to allocate the product and obtaining good prices for the extra product. In contrast, it is not easy to have a good share in high value markets, if the industry is not producing important volumes of the products that the market requires. To understand the means to face this dilemma needs an exhaustive analysis in the Uruguayan industry in order to finish this period of product stagnation.

Research is also needed in relation to the cost structure of the primary sector in Uruguay compared to New Zealand, as was presented in the research results. The low performance of the beef farms is a consequence of low use of fertilisers and pasture improvement. A comparative study of cost / kg of beef produced in Uruguay and in New Zealand for different production systems may help in this issue.

In New Zealand, one of the most significant advantages of the industry is based on the quota that the industry has in the North American market. However, what are the market opportunities beyond this quota, if there is an increase in the volume exported? This issue needs to be further studied.

8.7 - Concluding Remarks

This research attempted to identify and compare the sources of competitive advantage for the Uruguayan and New Zealand beef industries to obtain a deeper understanding of the factors affecting the international competition of both industries. Providing recommendations to firm managers or policy makers to increase the sources of competitive advantage in the industries in both countries is beyond the objectives of this research. In contrast, the main objective of this study was to identify, describe, compare and contrast what the current situations are with regard to the sources of competitive advantage or disadvantage for both industries, in order to provide useful information for further analysis and research.

REFERENCES

Adams, S., & Leggett, T. (2001). Specialisation Pays. *The New Zealand Meat Producer, 29*(1) pp. 34-36.

AFFCONZ, (2000). AFFCO home page. Retrieved, March 20, 2003 from http://www.affco.co.nz

Alonso, J.M., Perez Arrarte, C., & Pereyra, S. (1983). *La Economia de la Carne Vacuna y la Politica Neoliberal*. Montevideo: Editorial Hemisferio Sur.

Anderson, D.L., Britt, F. E., & Favre, D.J. (1997). The Seven Principles of Supply Chain Management. *Supply Chain management Review. Practice issue, Spring 1997*.

Antia, F. (2002). El Nuevo Escenario para el Financiamiento del Sector Agropecuario. *Anuario de OPYPA, 2002.*

Applied Management and Computing Division (AMAC) (1996). *Farm Technical Manual*. (1996). Canterbury: Lincoln University.

Applied Management and Computing Division (AMAC) (2002). *Financial Budget Manual (2002).* Canterbury: Lincoln University.

Arroyo, G (2001). El Negocio Ganadero en la Ultima Decada. *Revista Fucrea Agosto 2001, pp 27-30.*

Barney, J. B. (1996). *Gaining and Sustaining Competitive Advantage (2nd edition).* London: Addison-Wesley Publishing Company.

Barreto, D, Risso, D.F, Montossi, F., & Pigurina, G. (1998). Campos in Uruguay. *CAB International 2000. Grassland Ecophysiology and Grazing Ecology.*

Barry, P. J. (1995). Industrialisation of U.S Agriculture: Policy, research and education needs. *Agricultural and Resource Economic Review, 24 (1), 129-135.*

Bellak, C.J. & Weiss, A. (1993). A Note on the Austrian Diamond. *Management International Review, 33 (2), 109*

Bhattacharya, A. K., Coleman, J.L., & Brace, G. (1996). The Structure Conundrum in Supply Chain Management. *The International Journal of Logistics Management, 7(1), 39-48.*

Blanchard, J.V. (1993). Farmers Attitudes and Beliefs Toward a Bull Beef Supply Contract. *Unpublished Master Thesis, Massey University, Palmerston North, New Zealand.*

Boehlje, M. & Sonka, S.(1998). Structural Realignment in Agriculture. How do we analyse and understand it? *Retrieved, January 16, 2000 from http://www.ag.uiuc.edu/famc/program98/sonka.*

Boehlje, M. (1996). Industrialisation of Agriculture. What are the implications? *Choices, 30 (First Quarter 1996).*

Boehlje, M. (1998). Alternative Financial / Organisational Structures of farm and agribusiness Firms. Retrieved, January 16, 2000 from *http://www.agcom.purdue.edu/agcom/Pubs/NCR/NCR-568.1.*

Boland, M.; Boyle, E., & Lusk, C. (1999). Economic Issues with Natural and Organic Beef. Kansas State University. Agriculture Experiment Station and Co-operative Extension Service MF-2432.

Bowersox, D.J., Closs, D.J., & Stank, T.P. (1999). *21st Century Logistics. Making Supply Chain Integration a Reality*. Michigan: Council of Logistics Management.

Brash, D. (2000). The fall of the New Zealand dollar: why has it happened, and what does it means? *The Reserve Bank of New Zealand, Bulletin Vol. 63 no. 4.*

Cartwright, W.R. & Neville, N. (1992). Canada at the Crossroads. Business Quarterly, 57(2), pp. 10-13.

Cartwright, W.R. (1993). Multiple linked "Diamonds" and the International Competitiveness of Export-Dependent Industries: The New Zealand Experience. *Wiesbaden, 3. (2), 55.*

Chiara, G. (2002). Fuentes de Crecimiento de la Ganaderia de Carne. *Yearbook OPYPA, 2002.*

Cho, D.S. (1998). From National Competitiveness to Bloc and Global Competitiveness. Competitiveness Review, 8(1), pp 11-23.

Cho, D.S., & Moon H.C. (2000). *From Adam Smith to Michael Porter. Evolution of Competitiveness Theory*. Singapore: World Scientific Publishing Co. Pte. Ltd.

CIA (2001). The Fact Book New Zealand. Retrieved, September, 5, 2002 from http://www.cia.gov/cia/publications/factbook/geos/nz.htm .

CIDE (Comision de Investigación y Desarrollo economico), (1962).Los suelos del Uruguay, su Uso y Manejo. Montevideo.

COMISEC (1995) Analisis del Sector de Carne Bovina. COMISEC/BID-UE-PNUD. Convenios 702/OC – UR y ATN/EC – 4130 – UR.

Council of Agriculture Science and Technology (1997). U.S Meat Consumption Changing. Retrieved April, 10, 2002 from http://www.cast-science.org/anpr.nr.htm.

Council of Agriculture Science and Technology (CAST) (1999). Animal Agriculture and Global Food Supply. *Task Force Report. No 135.* Retrieved April, 10, 2002 from http://www.cast-science.org/anpr_nr.htm.

Crocombre, G. T., Enright, M.J., & Porter, M.E. (1991). *Upgrading New Zealand's Competitive Advantage*. Auckland: Oxford University Press.

Daly, D.J. (1993). Porter's Diamond and Exchange Rates. *Management International Review,* 33 (2), 119.

Daniels, J.D., & Svetlicic, M. (2001). *Competitiveness of Small Countries*. In Salvatore, D., Svetlicic, M., & Damijan, J.P. (2001). Great Britain: Antony Rowe ltd.

Darroch, J.L., & Litvak, I.A. (1992). Diamonds and Money. *Business Quarterly, 57(3), 71-76.*

Davies, H. & Ellis, P. (2000). Porter's Competitive Advantage of Nations: Time for the final judgement?. *Journal of Management Studies. 37 (8), 1189-1213.*

Day, G.S., & Wensley, R. (1988). Assessing Advantage: A Framework for Diagnosing Competitive Superiority. *Journal of Marketing. 52(April), pp 1-20.*

Dicosse, (2001) (2002). Stock Bovino, Cifras Preliminares. Retrieved July 19, 2002 from http://www.inac.gub.uy/stock.htm

DIEA, (2001) (2002). Anuario Estadistico Agropecuario. Ministerio de Ganaderia Agricultura y Pesca. Direccion de Estadisticas Agropecuarias (DIEA) Retrieved October 10, 2002 from http://www.mgap.gub.uy/diea/anuario2001/data .

Direccion de Meteorologia, (1994). Records Meteorologicos en el Uurguay. Boletin Meteorologico Mensual. Retrieved September 5, 2002 from http://www.rau.edu.uy/Uruguay/Geografy

Dunning, J.H. (1992). Internationalising Porter's Diamond. *Management International Review, 33(2), 7.*

El Pais Agropecuario, (2001). *Suplemento Agropecuario. Julio 2001.*

Ellsworth, P.T., & Clark Leith, J. (1984). *The International Economy (6th ed.)*. New York: Maximillian Publishing Company.

Fearne, A. (1998). The Evolution of Partnerships in the Meat Supply Chain: Insights from the British Beef Industry. *Supply Chain Management 3(4),* pp 214-231.

FUCREA, (2001). Revista Setiembre, 2001.

Geographic (2000). Retrieved September, 04, (2000) from http://www.photius.com/wfb2000/countries/uruguay

Grant, R.M. (1991a). The Resource-Based Theory of Competitive Advantage: Implications for Strategy Formulation. *California Management Review. Spring 1991, 114-135.*

Grant, R.M. (1991b). Porter's Competitive Advantage of Nations': An Assessment. *Strategic Management Journal, 12, 535-548.*

Guy, N. (2000). From New Zealand Gate to U.S.A Plate. New Zealand Beef. Winston Churchill Memorial *Trust 2000 Fellow.*

Hayenga, M., Schroeder, T., Lawrence, J., Hayes, D. Vukina, T., Ward, C. & Purcell, W.(2000). Meat Packer Vertical Integration and Contract Linkages in the Beef and Pork Industries: An Economic Perspective. American Meat Institute. Retrieved July 16, 2001 from the World Wide Web: http://w.w.w.meatami.org/indstructure 6700.pdf.

Hobbs, J. E. (1998). Innovation and future direction of Supply chain Management in the Canadian Agri- Food Industry. *Canadian Journal of Agriculture Economics,46,* 535-537.

Hodgetts, R.M. (1993). Porter's Diamond Framework in a Mexican Context. *Management International Review,* 33(2), 41.

Hudson, R.A. & Meditz, S.W. (1990). Uruguay a Country Study. Federal Research Division. Library of Congress Washington. Retrieved September, 04, 2002 from http://lcweb2.loc.gov/cgi-bin/query/r?frd/cstdy:@field

Hussey, J. & Hussey, R (1997). *Business Research. A practical guide for Undergraduate and Postgraduate Students*. London: Macmillan Press Ltd.

Ilundain, M. and Lema J.I. (2001). Carne Vacuna Situación Actual y Perspectivas. Anuario OPYPA, 2001. Retrieved August, 12, 2000 from: www.mgap.gub.uy/opypa/index.htm

Ilundain, M., Lema J.I., & Peyru, J.(2002). Carne Vacuna Situación Actual y Perspectivas. Anuario OPYPA, 2002.Retrieved May, 12, 2002 from www.mgap.gub.uy/opypa/index.htm

INAC, (1985). Análisis de la Infraestructura en Materia de Establecimientos de Faena e Industrializadores de Carne a Nivel Nacional y Sugerencias Sobre la Politica a ser Aplicada en el Sector. Distributed December, 1985.

INAC, (1990). Infraestructura de la industria frigorifica. Direccion de Ingenieria y procesos tecnologicos. Distributed Febrero 1990.

INAC, (2002). Instituto Nacional de Carnes. Pagina central. Retrieved October, 9, 2002 from www.inac.gub.uy/inacingles/serviciosen.htm.

Instituto de Economía (IE), (2002). *IV Jornadas de Coyuntura Economica Regional y Nacional.* Montevideo: Productora Editorial.

Jasimuddin, S. M. (2001). Analysing the competitive advantage of Saudi Arabia with Porter's Model. *The Journal of Business & Industrial Marketing, 16(1), pp 59-68.*

Katz, J.P., & Boland, M. (2000). A New Value - Added Strategy for the US Beef Industry: the Case of US Premium Beef Ltd. *Supply Chain Management: An International Journal, 5(2), pp 99-109.*

Kay, S. (2001). The New U.S Beef Industry (and its Impacts on New Zealand Beef Farmers). Central Districts / Wairarapa & East Coast Beef Council Seminars May 21-24, 2001.

Kinsey, J (2000). The Changing Global Consumer. IAMA 2000 World Food and Agribussines Congress, Chicago, USA.

La Nacion, El campo (2003, 29 May, 2003) Retrieved May, 29, 2003 from: www.lanacion.com.ar

Lamb, R.L., & Beshear, M. (1998). From the Plains to the Plate: Can the Beef Industry Regain Market Share?. Federal Reserve of Kansas City. *Economic Review. Third Quarter 1998.*

Lambert, D. M., Emmelhainz, M.A., & Gardner, J. T. (1996). Developing and Implementing Supply Chain Partnerships. *The International Journal of Logistics Management, 7(2), pp 1-18.*

Leamer, E.E., & Levinsohn, J. (1995). *International Trade Theory: The Evidence.* In Grossman, G.M., anf Rogoff, K. (1995). *Handbook of International Economics. Volume 3*. Amsterdam: Elsevier Science B.V.

Leborgne R., (1994). *Antecedentes Tecnicos y Metodologia para Presupuestacion en Establemientos Lecheros.* Montevideo: Editorial Agropecuaria Hemisferio Sur SRL

Lema, J. I. (2000). La Aftosa y su Implicancias en el Comercio Carnico. Anuario OPYPA, 2000. Retrieved July, 18, 2000 from www.mgap.gub.uy/OPYPA/ANUARIOS/anuariooo/ estudios/ 32_aftosa.

Lyck, L. (2002). Changed context for the Danish Tourism Industry: A Strategic Analysis. *Tourism and Hospitality Research, 3 (4), 311-318*

MAF (2002). Situation and Outlook for New Zealand Agriculture and Forestry. SONZAF

Martin, S. K. (1996). Risk Management Strategies in New Zealand Agriculture and Horticulture. *Review of Marketing and Agricultural Economics, 64(1), pp 31-44.*

Martin, S.K., & Shadbolt, N.M. (2000). Risk Management Strategies in the Whole Farm Contex. Workshops on Income Risk Management, OECD, Paris. World Wide Web: http://w.w.w.1.eocd.org/agr/irm/doc/agrshad.pdf

Maughan, C.W. (1998). Read Meat. In Pickford, M & Bollard, A. (1998). The Structure and Dynamics of New Zealand Industries. Palmerston North: Dunmore Press. Pg 25-52.

Meat and Wool Economic Service of New Zealand (MWESNZ), (2000). Compendium of New Zealand farm Production Statistics. Publication N^{o} 62141. March 1999.

Meat Industry Association, MIA, (2002) (2001). Annual Reports.

Meat New Zealand (MeatNZ). (2002) (2003). The business of New Zealand Beef. Wellignton: Country-Wide Publications Ltd.

Mentzer, J.T.(1993). Managing Channel Relations in the 21st Century. *Journal of Business Logistics, 14 (1), pp 27-42.*

MetService (2002) The climate of New Zealand. Retrieved September,05,2002 from http://www.metservice.co.nz/learning/weather_climate_of_nz.as

MGAP(Ministry of Agriculture and Fisheries), (2002). Retrieved March 12, 2003. from www. mgap.gub.uy.

Miles, M.B., & Huberman, A.M. (1994). Qualitative Data Analysis. Second Edition. California: Thousands Oaks.

Miller, A (1998). *Strategic Management, 3rd ed.* Irwin Mc Graw-Hill.

Ministry of Agriculture and Forestry (MAF), (2001) Annual Review of the New Zealand Sheep and Beef Industries 2000-2001. The Economic Service MAF.

Monteiro, M. D. (2001) Vertical Co-ordination in the New Zealand Beef Industry: An Analysis of Risks and Return for Farmers and Meat Processors. *Unpublished Master Thesis, Lincoln University. New Zealand*

Montes de Oca Mungría, O.E (1999). Vertical Co-ordination in the New Zealand Lambs Supply Chain: Implications for Breeders, Finishers and Processors. *Unpublished Master Thesis, Massey University. Palmerston North New Zealand*

Moon, H.C., Rugman, A.M., & Verbeke, A. (1998). A Generalised Double Diamond Approach to the Global Competitiveness of Korea and Singapore. *International Business Review, 7, pp 135-150.*

Narula, R. (1993). Technology, International Business and Porter's Diamond: Synthesising a Dynamic. *Competitive Development. 33(2), 85.*

National Agricultural Census NAC (2000). Resultados Definitivos Volumen 1 & 2.

Nulty, P. (1997). Constructive Demolition. *Worldbusiness,3 (1) pp 52-53.*

O'Connell, L., Clancy, P., & Van Egeraat, C. (1999). Business Research as an Educational Problem-Solving Heuristic – the Case of Porter's Diamond. *European Journal of Marketing, 33(7/8), 736-745.*

O'Keefe, M (1998), Establishing Supply Chain Partnerships: Lessons from Australian Agribusiness, *Supply Chain Management, 46, pp 549-558.*

O'Keefe, M. (1997) Supply Chain Management. *Agricultural Science,10(3).*

Ohmae, K. (1989). The Global Logic of Strategic Alliances. *Harvard Business Review (March-April), pp 143-154.*

OPYPA, (2001). Anuario, 2001. Retrieved August 12, 2002. from www. Mgap.gub.uy/opypa/index.htm

Ordeix, M. (2001). "Competitividad y Co-ordinación de la Cadena de Carne Bovina" . Serie de Actividades de Difusión Nº277. INIA Tacuarembó.

Oz, O. (2002). Assessing Porter's Framework for National Advantage: The Case of Turkey. *Journal of Business Research, 55, pp 509-515.*

Peterson, C., & Wysocki, A. (1998). Strategic Choice along the Vertical Co-ordination Continuum. AAEA Symposium, Michigan State University Staff Paper # 98-16.

Picerno, A. (1999). Una Vision Global. Publicaciones OPYPA. Retrieved January, 22, 2003 from www.mgap.gub.uy/opypa/publicaciones/litpa/vision_global.

Picerno, A., & Sader, M. (2002). Informe Sobre Endeudamiento Bancario del Sector Agropecuario. Anuario OPYPA, 2002.

Porter, M. (1985). *Competitive Advantages. Creating and Sustaining Competitive Advantage.* New York: The free Press.

Porter, M.E. (1980) *Competitive Strategy. Techniques for Analysing Industries and Competitors.* New York: The Free Press.

Porter, M.E. (1990). *The Competitive Advantage of Nations.* New York: The Free Press.

Porter, M.E. (1998). *On Competition.* Harvard Business Review Book Series: Boston. Chapter 7: Clusters and Competition. Pg. 197-271.

RaboBank, (2001). Global Focus Beef. Agribusiness Consulting and Research Services in Conjunction with Nimmo-Bell & Co. ltd. RaboBank New Zealand Limited –June 2001.

Revista Plan Agropecuario. March-April, (2002).

Rugman, A.M. & Cruz, J. R. (1993). The Double Diamond Model of International Competitiveness: The Canadian Experience. *Management International Review*, 33 (2), 17.

Rugman, A.M. (1991). Diamond in the Rough. *Business Quarterly, 55(3), 61.*

Rugman, A.M. (1992). Porter Takes the Wrong Turn. *Business Quarterly, 57(3), pp 59-64.*

Rugman, A.M., & Verbeke, A. (1993). Foreign Subsidiaries and Multinationals Strategic Management. An Extension and Correction of Porter's Single Diamond Model. *Management International Review*;33 (2), 71.

Ryan, U., Pitts, E., & Lenihan, H. (1999). International Competitiveness of the Irish Shellfish Processing Industry – an Adapted Porterian Analysis. *Irish British Administration Research, 20(1), pp 79-100.*

Severoa, V.(1997). Clima del Uruguay. Retrieved September, 05,2002 http://www.rau.edu.uy/uruguay/geografia

Spring, D. (1992). An International Marketer's View of Porter's New Zealand Study. *Business Quarterly, 57(3), pp 65-70.*

Statistics New Zealand (2002). Retrieved September 05, 2002 from http://www.stats.govt.nz/domino/esterna

Tan, K. C., Kannuan V.R., & Hanfield R. B. (1998). Supply chain Management: Supplier Performance and Firm Performance. *International Journal of Purchasing and Materials Management*

Taylor, D.H. (1997). Global cases in Logistics and Supply Chain Management. London: ITBP

Thatcher, M. (1997). Ace of Diamonds. *People Management, 3(21) pp 36-39.*

The Economic Service (2002). New Zealand: New Season Outlook 2002-03. Paper N^{o} 62223.

The National Bank (2002). Rural Reports. Retrieved on March, 10, 2003 from http://www.nationalbank.co.nz

The Royal Society of New Zealand (2001). Climate change: The IPCC Third Assessment Report. Wellington Workshop May, 2001.Retrieved August, 16, 2001 from http://www.rsnz.govt.nz/advisory/nz_climate.

The World Gazetteer (2002). Retrieved on September, 04,2002 from http://gasetteer.de/r/r_uy.htm

Towil, D.R., & Eng, F. (1996). Time Compression and Supply Chain Management – A guided Tour. *Working Paper. Cardiff, Wales: University of Wales.*

Turner, P. (1994) Japanese financial services organizations: Contrasting market experiences between 1985 and 1993. *The International Journal of Bank Marketing, 12(1), 3.*

Van den Bosh, F. A. J., & van Prooijen, A.A. (1992). European Management: An Emerging Competitive Advantage of European Nations. *European Management Journal. (10)4, 445.*

Van den Bosh, F. A. J., & Van Prooijen, A.A.& Porter, M. (1992). The Competitive advantage of European Nations: The Impacts of National Culture. A missing Element in Porter's Analysis?; A note on Culture and Competitive Advantage: Response to van den Bosch and Van Prooijen. *European Management Journal, 10 (2), 173.*

Vazquez Platero, R.,& Picerno, A. (1994). Comercializacion del Ganado en Pie. *Proyecto COMISEC/BID-UE-PNUD. Convenio 702/OC – UR y ATN/EC – 4130 – UR.*

Vega, J.P. (2001). Clusters and Competitiveness in Developing Countries". A case study on the Uruguayan Beef Industry. Unpublished Mater of Business Administration Dissertation. The Judge Institute of Management Studies. University of Cambridge, Cambridge England.

Vernazza & Cesar, (2002). El Mercado Domestico del Uruguay. Seminario del Campo al Plato.

Vilanova, M & Patrone, (2002). Análisis de la Capaciad de Faena y Desosado de los Establecimientos Habilitados a Nivel Nacional. Unpublished December, 2002. Unpublished.

Weihrich, H. (1999). Analysing the competitive advantages and Disadvantages of Germany With the TOWS Matrix- an alternative to Porter's Model. *European Business Review, 99. (1), 9-22.*

Wilson, T. W. (1995). An Integrated Model of Buyer – Seller Relationship. *Journal of the Academy of Marketing Science,23(4) pp 335-345.*

Wood, M. (2000). Notes on Research Methods. Portsmouth University, Retrieved December 11 2000 from www.pbs.port.ac.uk/woodm/rmnotes

Woodford, K. (2001). *Foreign Exchange Rate Fluctuations and the common Currency Debate: What does it means for New Zealand Agribusiness. Book of Readings MGMT 673 Lincoln University.*

Wright, L., & Blanchard, V. (1994). Market Supply Issues. *Rural Management, 5 (Spring/Summer), pp* 30-31.

Wylaars, M.J. (1994). Implicit Contracts as a Method of Vertical Co-ordination in The New Zealand Meat Industry. Unpublished Masters Thesis Massey University, Palmerston North, New Zealand.

Yin, R.K. (1994). *Case Study Research. Design and Methods. (2nd edition).* London: Sage Publications.

Yla-Anttila, P. (1994). Industrial Clusters-A Key to New Industrialisation? Kansallis-Osake-Pankki. *Economic Review,(1), 4.*

APPENDICES

Appendix I: Uruguayan Statistics

Source Description[86]	Data Obtained from these Source
INAC: Instituto Nacional de Carnes (The National Meat Institute). Location: http:/www.inac.gub.uy	• Slaughter statistics: weekly monthly and annual data on total slaughter, slaughter by class, age to slaughter, weigh of cattle to slaughter, % dressing, slaughter by licensed processing plant • Exports statistics: type of product (bone in/boneless and type of cuts) product exported by exporter, and by market • Cattle price, farm gate price, on the hook price (in the domestic market and FOB prices received in the international markets.
OPYPA: Oficina de Planeaminto y Presupuesto Agropecuario (Office of Planning and Agriculture Policy) Location: http://www.mgap.gub.uy/opypa	• Annual outlook of the livestock farms performance • Livestock market outlook (domestic and international markets) • Annual beef production (live weight) • Cattle live exports • Average performance (physical and economic) of sheep and beef farms • Cost of beef production per kilo live
FUCREA: Federacion Uruguaya de Grupos Crea. Uruguayan Federation of CREA Groups. It is a private association of farmers, who share technological assistance and collect the information for economical analysis. The information gathered is published once a year to the public Source:Fucrea Jornadas de Intercambio Economico en ganaderia, 1198,1999,2000,2001,2002).	• `Sheep and beef farms' performance
PRONADEGA: Programa Nacional de Desarrollo Ganadero (National Programme of Cattle Development) It was an aid program founded with international money and carried out by the MGAP with the objective of increasing the managerial ability of medium size farm managers.	• Sheep and beef farms' performance

[86] Most of these sources are available on periodical publications and on the internet.

DIEA: Direccion de Estadistica Agropecuaria (Office of Agriculture Statistics) Location: http://www.mgap.gub.uy/diea/	• Farm inputs and product prices (e.g fertilisers, wages, seeds, kg steer interest rate) • Farm land prices • National Agricultural Census (NAC) which is carried out by DIEA each 10 years in Uruguay. It provides information about number of farms, type of production system, resources used, performance of different type of farms, infrastructure among others.
DICOSE: Dirreccion Contralor de Semovientes (Livestock Control Office) Location: http://www.inac.gub.uy/stock.	• Livestock number and evolution by class • Average stoking rate
PA: Plan Agropecuario (Agriculture Plan)	• Sheep and beef farms' performance
IE: Instituto de Economia (Economy Institute – Faculty of Economic – University of the Republic). Location: http://www.icon.ccee.edu.uy	• Interest rate • Inflation rate • Exchange rate

Appendix II: New Zealand Statistics

Secondary Source	Data Obtained from these Source
Agri-fax Information provided by Rod Mc Kenzie owner of Agri-fax. Financial Budget Manual Lincoln University Agribusiness and Economics Research Unit MAF: Ministry of Agriculture and Forestry. SONZAF: Situation and outlook of New Zealand Agriculture and Forestry. Location: http://www.maf.govt.nz/maf MIA: Meat Industry Association Annual Reports Meat New Zealand Location: http://www.meatnz.co.nz National Bank Location: http://www.nationalbank.co.nz The Economic Service (Meat and Wood Economic Service MWES) Location: http://www.economic service.co.nz	• Slaughter statistics • Farm gate prices • FOB prices • Average cost processing companies • Farm inputs cost • Cattle and beef price • Beef exported volume and prices • Farm performance • Farm gate prices • Outlook • Exports: volume, prices, products and destinations • Beef processing and export by class • Beef export by product and destination • Value of New Zealand export • Cattle location in New Zealand • Processing plants location • Processing plants description • Interest Rate • Exchange Rate • Inflation Rate • General macro-economic environment • Annual review of the New Zealand sheep and beef industry (livestock, production, markets and prices) • Sheep and beef farm survey. Production and financial analysis from a sample of sheep and beef farms for the season July 1st to June 30th .

Appendix III: Interviews Carried out in Uruguay

Interviewee Processing Plants	Interviewees
Figorifico TACUAREMBO Ruta 5 y 26 Tacuarembo CP 45000 Uruguay Ph: (598) - 63 - 23641	Date Interview: 29/11/2002 Dr. Marcelo Secco Arias (General Manager) Dr. Juan Manuel Leites (Cattle Purchase Manager Ag. Eg. Rafael Telleria Arias (Chaiman) Ch. Marta Isasa Amosa (Quality Manager)
Figorifico PUL Ruta 8 km 389 Melo – Uruguay Ph: (598) - 64 - 25593/96	Date interview: 26/11/2002 Sr. Hugo Revello Conde (Cattle Purchase Manager and Chairman) Sr. Miguel de Souza Gularte (Marketing Manager) Sr. Patricio Silvera (Plant Manager)
Frigorífico SAN JACINTO	Date interview: 5/12/2002 Dr Jorge Barrios(Chairman) Sr. Carlos Segredo (Cattle Purchase Manager) Gabriel Slinger (Plant Manager)
Establecimientos Colonia S.A. Ruta 22 km 30 – Tarariras Colonia - Uruguay Ph: (598) - 574 – 2078/2682	Date interview: 2/12/2002 and 3/12/2002 Miguel Becaria (Marketing Manager) Juan Carlos Jones (Plant Manager) Martin Piñeyro Couto (Cattle Purchase Manager)
Frigorífico Elbio Perez Rodríguez S.A. Zabala 1542 Montevideo – CP 11.000 – Uruguay Ph: (598) - 342 - 2662	Date interview: 7/12/2002 Dr. Wilson Rochon (Cattle Purchase Manager) Nicolas Grunwaldt (Commercial Manager)
Frigorífico Matadero Carrasco S.A. Con Carrasco No 5 – Paso Carrasco Canelones – CP 14002 – Uruguay Ph: (598) -2- 601 40 02-08	Date interview: 9/12/2002 Ch. En. MBA Beatriz Briano Cal (Quality Assurance Department)

Interviewee Key Informants	Data Obtained from this Interviewee
Ag. Eg[87].Guillermo Pigurina (MSc.) Director of Technical Services of the Agro-industrial Chain (INAC) Rincon 545 11000 Montevideo - Uruguay Ph: (598) – 2 916 04 30 Interview: 2/12/2002 10.00 a.m.	• Role of INAC • Beef Traceability in Uruguay • Beef industry in Uruguay overview
Dr. Eduardo Paradiso MGAP – Sanitary Division Director Constituyente 1476 2º piso 11200 Montevideo - Uruguay Ph: (598) – 2 412 6369 Interview: 2/12/2002 10.00 a.m	• Sanitary regulation in Uruguay • FMD outbreak • Contention measures • How Uruguay is prepared to FMD
Ing. Agr. Carlos Maria Uriarte (Ms Agric. Sc.) Plan Agropecuario General anager Bvar Artigas 3802 11700 Montevideo - Uruguay Ph: (598) 2 203 4707 Interview: 2/12/2002 10.00 a.m	• Support for beef farmers • Role of PA • Main limitations primary sector
Ing. Agr Daniel De Mattos (Phd) Head of Beef Cattle Program INIA (Tacuarembo) Ph:(598) 642 -4560 Interview: 28/11/2002 14.00 p.m	• Research, technology generation and transference in Uruguay • Role of INIA • Main research projects • Farm research • Research at the processing industry
Ing. Agr.Gonzalo Gonzalez (PHd) Ministry of Agriculture Interview: 13/12/ 2002 15.00 p.m)	• Sources of Competitiveness of the Uruguayan beef Industry from the point of view of the Ministry of Agriculture • The main weaknesses • Strategies implemented by the Government to support the beef industry • Future objectives of the Ministry of Agriculture • Situation of the beef industry after the FMD outbreak
Eg. Maria del Carmen Vilanova Technical Services of the Agro-industrial Chain (INAC) Treinta y tres 1356 piso 1 11000 Montevideo Uruguay Interview: 5/12/ 2002 (10.00 a.m)	• INAC regulations for licensing of plant • Processing capacity of the processing plants • Infrastructure in the processing plants

[87] Ingeniero Agronomo Agriculture Engineer

Appendix IV: Interviews Carried out in New Zealand

Interviewee	Data Obtained from this Interviewee
Mr. Brent Rawstrom (Owner and Manager of Rossendale Winery) Contact Details: 150 old Tai Tapu Rd. Ph: 64 – 3 - 3227780 Interview :11 February 2003 (13.00 p.m)	• Example of focus strategy. • Competitive advantage of New Zealand in its beef industry • New Zealand environment to develop an entrepreneur business in the beef industry • Limitations from the government
Mr. Mark Clarkson (Manager Canterbury Meat Packers) Seafield PO Box 101 Ashburton 8300. Ph: 64 – 3 - 3027699 Interview: 17 March 2003 (9.00 a.m)	• Example of marketing strategy. Providing fed-lot beef to Japan) • Cattle purchase strategy • Marketing Strategy • New Zealand environment for the beef industry
Mr. Rod M^{c} Kenzie (Owner Agri-fax) Greta Valley – North Canterbury Ph: 64 – 3 – 3143475 Interview :15 February 2003 (14.00 p.m)	• Cattle slaughter • Cost at the processing industry • Price paid to farmers
Mr. Mick Calder (NZ Lamb Company) Agribusiness Consultant Floor 5 85 Terrace Wellington Interview: 19 February 2003 (10.00 a.m)	• Policies and regulations in New Zealand that may affect the beef industry • Institutions related to the beef industry and how they affect the industry.
Mr. Sam Robinson (Chairman Richmond) PO Box 940, Hastings 068786464 Interview: 22 February 2003 (3.00 p.m.)	• Overview of the processing industry in relation to beef. Focussing on the relationship farmers processors. • Marketing Strategy
Mr. Neil Taylor (Chief Executive Office Meat New Zealand) 10 Brandon St. PO Box 121 Wellington 6015 New Zealand Ph: 64 4 473 9150 Interview: 21 February 2003 (10.00 a.m.)	• Farmers position in regards with signing the Kyoto protocol • International Agreements in regards with WTO agreements, Uruguayan Round GATT). • Meat New Zealand main roles • FMD in New Zealand. How the country is prepared to face it.